Ancient Sanskrit Wisdom

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Ancient Sanskrit Wisdom

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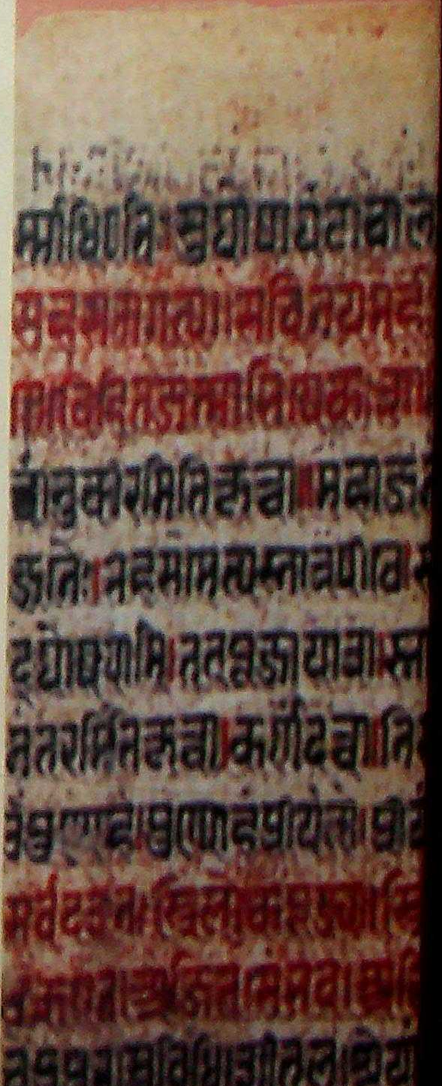
Modern Science and Beyond



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ANCIENT SANSKRIT WISDOM

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MODERN SCIENCE AND BEYOND

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ANCIENT SANSKRIT WISDOM

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MODERN SCIENCE AND BEYOND

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Preface

The Union Ministry of Human Resource Development, Government of India, has assigned importance to Sanskrit and other languages as an integral part of National Policy of Education.

"We are fully convinced that Sanskrit, with its rich vocabulary and flexibility in the formation of words and phrases, is the mother of most of the languages in the World. We can trace the influence of Sanskrit not only on all the Indian languages but also on the languages in Europe and South-East Asia. If we cast our critical eyes on the different Indian languages then we discover that more than 75-80% of the words used in most Indian languages originate from Sanskrit. Learning of Sanskrit cannot be in isolation. We have to take note of the mass of knowledge that is being produced in Science and Technology affecting the lives of the people like never before. All this should necessarily find place in the Syllabus of Sanskrit studies."

I have discussed some areas to bring out that Ancient Sanskrit Literature contains all the knowledge known to the modern world whether it may be in the area of Science, Mathematics, Governance of State, or Social Issues. The Beauty of Sanskrit Wisdom is to develop such a society where people live in harmony and shun materialism—the root cause of all problems. In addition Ancient Sanskrit Wisdom while advocating the enjoyment of Kama and Artha subject to Dharma as well as attain Moksa (Liberation). It does not mean that modern knowledge is not needed. What is required is that Indian Philosophy, Science and Religion should work in co-operation to benefit the society. I have divided this book into 9 chapters dealing with methodology of knowledge (Research Methodology) to achieve good life in this world and the next world. This is followed by analyzing the structure of Physical World, problems created by modern science and the ancient knowledge to solve them like Environment pollution. Then there are chapters on Governance, Human Resource Development to make the social system work as per the Dharma, i.e. through righteous action.

The concept of education is explained in some ancient Sanskrit books, which compares quite favourably with modern trends of thought. Sa vidya ya vimuktaye, that is real learning which leads to liberation or emancipation. Here Vidya or learning means education and liberation means the solution of a problem that presents itself to us on any occasion. Thus, the education that we get must prepare you to solve the questions in life that crop up in our undertakings. Man is confronted in this world with questions that may be simple enough like 'crossing a street' and very difficult like 'realizing his own spiritual nature'. His education should help him to solve them all successfully. Knowledge has been given a vital place as can be seen from the following verse:

ज्ञानं तृतीयं मनुजस्य नेत्रम् । समस्ततत्त्वार्थ-विलोकदक्षम् ।
तेजोऽनपेक्षं विगतान्तरायम् । प्रवृत्तिमत्सर्वजगत्त्रयेऽपि ।।

Education works as third eye to man. The difference between mere learning and development of intelligence was known to the ancients, as is clearly explained in this verse :

यस्य नास्ति विवेकस्तु केवलं यो बहुश्रुत: ।
न स जानाति शास्त्रार्थान् दर्वी पाकरसानिव ।।

So both knowledge and intelligence were expected of an educated person; and the process of getting knowledge does develop intelligence.

Ancient Rishis were great discoverers. They developed a Karma Theory (Action theory). Its crystal form is found in Gita. We can say that like the third law of Newton, which was operative on material things, Rishis propounded a similar law in the social realm, which they called Karma Theory. They said that a man is free to act and he will have to bear the consequences of his each and every action, good or bad either in this life or in the next life or in successive lives. They further said that good deeds will give good results and bad deeds bad results. To my mind this was a novel but effective way to keep people on the virtuous path.

Even the world is disillusioned by the concept of modern Development based on GNP and adopting to the concept of well-being as wealth as contained in ancient scriptures. Winston Churchill has rightly said :

"We make a living by what we get. We make a life by what we give."

Rajni Bakshi rightly feels that after all, the concept of GNP was only ever meant to measure the amount of goods and services produced in an economy. The problem is that GNP is an artifact from a time when it was assumed that if there are more goods in circulation, general welfare will automatically follow. Today, there is extensive documentation to show that this is not always true. Thus, in the early 1990s the UNDP introduced the Human Development Index.

Since 1995, a San Francisco-based think-tank called Redefining Progress has been annually assessing the American economy with an alternative yardstick called the Genuine Progress Indicators (GPI) which presents a relatively grim picture of American society. The GPI index shows a steady decline in the US after the late 1970s even as the GNP has continued to steadily rise. This is because the GPI index gets closer to the reality of people lives by treating as a loss, for example, all money spent on either preventing crime or preparing damage caused by it. Similarly, all money spent to counter the effect of environmental degradation or divorce is counted as a loss.

Countries as diverse as Costa Rica, Canada, Iceland, Netherland, Sri Lanka and Mongolia have established well-being indicators. These indicators can act as powerful tools for action by citizens because policy-makers cannot claim success merely on the basis of GNP statistics. Since it is also true that what is not measured is not adequately valued, or managed. These indicators help keep policy-makers more in line with the reality of people's lives.

Rajinder Singh Ji Maharaj in his ideas said that a soul infuses 'life' in the human body for a certain period of time. When the soul inhabits the body it is still one with God. The soul, however, is overpowered by powerful forces such as the mind, the body, and the outer world, which cause it, over time, to forget itself. The soul slowly begins to identify itself with the body, mind and world outside. It is attuned to only one channel—the channel of the world.

The saints and mystics tell us that we have the choice to either stay tuned to this physical world, or to tune into the channels of God. For this we must stop identifying with the body, mind and temporal world, and identify with the soul instead. When our outer programming is turned off, then in the silence we will experience ourselves as soul, or a condition of self-knowledge. Once we identify with the soul, we will pick up the frequencies the soul is capable of receiving. God has not made it hard for us to become aware of our true Home. It is we who have made it complicated.

According to Albert Einstein, "It is every man's obligation to put back into the world at least the equivalent of what he takes out of it."

Ramaranjan Mukherji, formerly Chancellor, Tirupati Rashtriya Sanskrit Vidyapeetha Deemed University, delivered the Convocation Address at the Seventh Annual Convocation of Shri Lal Bahabur Shastri Rashtriya Sanskrit Vidyapeeth, New Delhi. He rightly stated that in the field of Sanskrit learning there are two techniques : the old and the new. In the old style each word is analysed and the purpose served by its insertion is expounded, as a result of which the learner becomes able to penetrate deep into the Shastras. In sharp contradistinction to it in the modern techniques there is comparative analysis and an attempt to place the knowledge generated by ancient Indian wisdom in wider canvas of the knowledge produced by wisdom of the world in order to show the place occupied by ancient Indian knowledge in the unending sheet of knowledge generated in the world. The Sanskrit Universities have to effect combination of these two techniques. This dream visualized by

Tagore that is spreading the magnificent message of Sanskrit, which stands for dignity of man, universal tolerance and harmony, global peace and fraternity throughout the length and breadth of the globe.

I am grateful to the UGC, for providing funds for this project and Panjab University, Chandigarh for providing facilities and other research institutions for allowing me to consult their documents and books.

I am sure that this research would help to understand that India had its rich heritage and we must follow our ancient scriptures to promote the welfare of people and country. Indigenous solutions would only lead to real progress. In addition, I feel that it requires more researches in this area to bring to light our hidden treasures. I am prompted to continue my research in this area and encourage others as well.

ARUNA GOEL

CHAPTER I

SANSKRIT LITERATURE AND MODERN KNOWLEDGE

> Sanskrit has a pre-eminent position among all languages as its knowledge helps access the vast treasures of wisdom contained in our ancient scriptures. The Government is committed to the development of Sanskrit, which will be done with the help of modern technology.
>
> —*Tenth Plan (2002-2007)*

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CHAPTER

Sanskrit Literature and Modern Knowledge

I. SANSKRIT AS A LANGUAGE (See Chart 1.1)

Sanskrit is the mother of all languages. From the language of the Rgveda, as Keith observes, 'we can trace a steady development to classical Sanskrit, through the later Samhitas and the Brahmanas'.[1] Yet such is the marvelous continuity" says Max Muller "between the past and the present of India, that in spite of repeated social convulsions, religious reforms and foreign invasion, Sanskrit may be said to be still the only language that is spoken over the whole extent of the vast country." It has also been said by M. Winternitz: "Sanskrit is not a 'dead' language even today. There are still at the present day a number of Sanskrit Periodicals in India, and topics of the day are discussed in Sanskrit Pamphlets. Also, the Mahabharata is still today read aloud publicly. To this very day Poetry is still composed and words written in Sanskrit and it is the language in which Indian Scholars converse upon scientific question. Sanskrit at the least plays the same part in India still, as Latin in the Middle Ages in Europe, or as Hebrew with the Jews."[2]

The Sanskrit language has become inextricably linked up with the people as the respository and expression of their life and thought. Taking a sober view of Hindu antiquity, Sanskrit has served the Indian people for more than three thousand years. From the Vedas onwards right down to the present age, the Sanskrit tradition in the Indian scene has remained uninterrupted; and in spite of the evil days on which Sanskrit like all purely intellectual and cultural studies, has fallen, the Sanskrit tradition still continues to be effective within its own sphere.

In considering Sanskrit, we have to note two great facts as far as the present day India is concerned. Firstly, Sanskrit has been, and still continues to be, the one great unifying factor for the people of India.

India is a multi-racial and a polyglot country, and inspite of a basic Indianism which embraces all, there is a bewildering diversity (though in non-essential) in the spiritual approach of the Indian peoples. But the basic character of India, her great all India background, her Indianism, her Bharata-dhrama or Bharata yana is linked up with Sanskrit.[3]

Classical Sanskrit received its first serious study and formulation with Panini (c. fifth century B.C.). Before him, the Aryan language was in a fluid state, like any other spoken language. Panini's great Sanskrit grammar in some 4,000 aphorisms in eight chapters, called the Astadhyayi, ushered in quite a linguistic revolution by stabilizing the norms of the language, leaving enough scope for the incorporation of later forms and modifications growing within the framework of the principles laid down by him.

A great many works in this later Classical Sanskrit, the Mahabharata, the Ramayana, the Puranas, and other works, such as the Dharmasastras, acquired almost the same sanctity as the Vedic texts. Thus, Sanskrit with its expanding literature became a dynamic force to dominate, absorb, and direct most of the cultural and linguistic movements in the following centuries.

Panini's great influence standardized the Sanskrit language firmly; Sanskrit continued to be the mightiest force in the literary, linguistic, and cultural world of India. The later forms of the Into-Aryan speech, the Prakrits (Pali and the rest), were taken up by the heterodox sects, the Buddhists and the Jains and their teachers, who created a great literature in these forms. But from the beginning the prestige and importance of Sanskrit almost overwhelmed them.[4]

Sanskrit is a source of development of other languages in India. Most of the Indian languages, e.g. Telugu, Marathi, Kannada, etc. have borrowed words from Sanskrit to enrich their vocabulary. Sanskrit being a source of scientific knowledge, means a great influence on intellectual life. The efforts of Government of India in promoting this language would lead to more popularity of this language. The UGC has given substantial grants to popularize Sanskrit language to universities and colleges. It is suggested that Sanskrit teachers whether in the universities or colleges or schools or gurukulas should engage seriously in the promotion and development of Sanskrit. They should not only get salary for teaching the subject but must make a mission to popularize Sanskrit among masses.

2. SANSKRIT AND ITS IMPACT ON THE LIFE OF PEOPLE AND CIVILISATION

Besides a language as others are Sanskrit is a treasure of all types of knowledge—whether Science, Mathematics, Astronomy, Architecture, Psychology, Medicine, Social science and that is why its study and application are a need of 21st century. People in foreign land have benefited a lot from its study through translation while we have not availed of much benefit as we were engaged merely in worshipping Sanskrit and its documents. We know that, 'Words, written or spoken are of no use unless put to action'. It is good that we are now awakening and finding the glory of Sanskrit to enrich the quality of our life.

Indian life revolves around Indian literature contained in Upanisads, the Ramayana, the Mahabharata and the Puranas with Dharmshastras in the background. They have influenced the life and heritage of the country for more than 2000, years. Besides there is lot of literature from Jaina and Buddhist literatures. Indian literature has also assimilated many features from other literature.

No less a person than Pt. Jawaharlal Nehru, our first Prime Minister, has accepted the pre-eminent position of Sanskrit: "If I was asked what is the greatest treasure which India possesses and what is her finest heritage, I would answer unhesitatingly—it is the Sanskrit language and literature, and all that it contains. This is magnificent inheritance, and so long as this endures and influences the life of our people, so long the basic genius of India will continue." He again emphasized while delivering his address at the University of Poona on the occasion of conferring the honorary degree of D.Litt. on him, the beauty and role of Sanskrit language. To quote him:

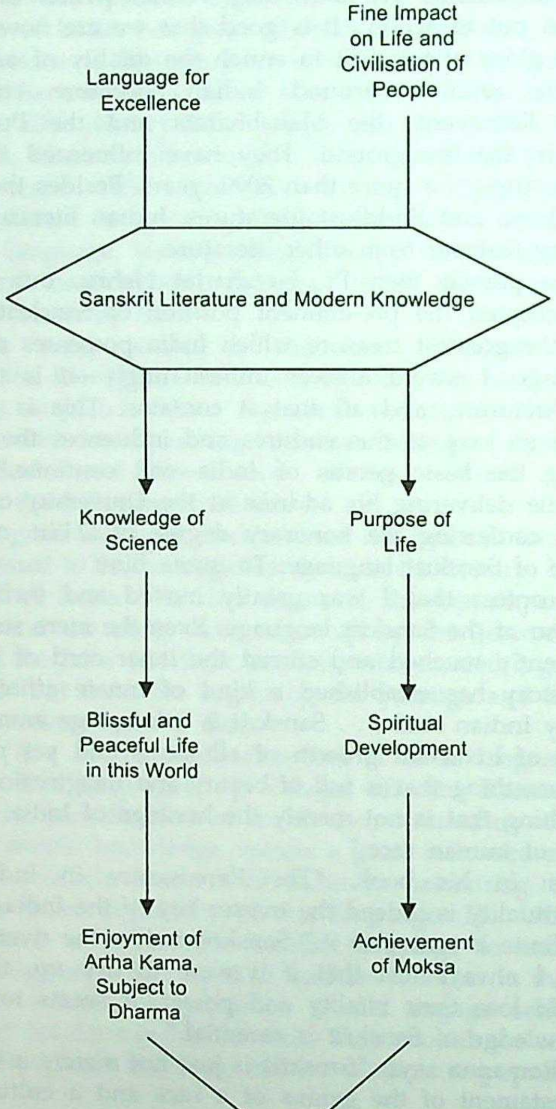
"I must confess that I was greatly moved and thrilled by the mellifluous rthym of the Sanskrit language. Even the mere sound of that language has gently touched and stirred the inner cord of my heart. I believe that history has established a kind of innate affinity between Sanskrit and my Indian soul . . . Sanskrit is a language amazingly rich, efforescent, full of luxuriant growth of all kinds and yet precise. The world misses something that is full of beauty and imagination and deep thinking, something that is not merely the heritage of India, but should be the heritage of human race."

Aurobindo in his book, "The Renaissance in India" rightly remarked, "Spirituality is indeed the master key of the Indian mind, the sense of the infinite is native to it." Sanskrit is like the river Ganga for our languages. I always feel that if it were to dry up, the regional languages would lose their vitality and power. It seems tome that an elementary knowledge of Sanskrit is essential."

Dr. Raja Ramanna says: "Sanskrit is just not merely a language. It is the poetic testament of the genius of a race and a culture and the living embodiment of the thoughts and fancies that have moulded them. It represents a culture, nay, a total integrated culture known as Indian Culture. The very word, "Sanskrit" means "culture."

Sanskrit alone has that pre-eminence over the great regional language, enabling her to maintain and uphold in every region of India the supreme claim of Indian unity. It may indeed be said that one who knows Sanskrit is a better Indian for he is in a position to appreciate what every part of India has contributed to it. With Vyasa he could roam

CHART 1.1


Fine Impact on Life and Civilisation of People
Language for Excellence
Sanskrit Literature and Modern Knowledge
Knowledge of Science
Purpose of Life
Blissful and Peaceful Life in this World
Spiritual Development
Enjoyment of Artha Kama, Subject to Dharma
Achievement of Moksa
Liberated Life

about in the forests and pilgrimage centers of the whole country, with Valmiki he could visit Lanka, with Kalidasa, see the glories of Ujjain, walk in the Himalayan valleys, or follow the cloud from Ramagiri to Kailash, with Bhartrihari contemplate on the vanities of the world, with the merchants of Samadeva travel to different islands and even to Kanakpuri with Shudraka live the life of a gay nagarika.

Sanskrit Commission appointed in 1957 by Govt. of India on the subject of Sanskrit and National Solidarity rightly observes "Sanskrit and National Solidarity." The Commission, traveling from Kerala to Kashmir and from Kamarupa to Saurashtra, found that the people of this country, though they differed in a number of ways, all were proud to regard themselves as participants in a common heritage; and that heritage emphatically is the heritage of Sanskrit. It is the binding force for the different people of this great country. According to the Commission one of the witnesses who appeared before it went to the length of suggesting that if the Sanskrit Commission had come before the State Reorganization Commission, many of the recent bickering in our national life could have been avoided.

J. Mishra in his presidential address to the 38th All India Oriental Conference held at Jadavpur University, Calcutta (January 28-30, 1997) rightly observe. It is a well known fact that Sanskrit is the Mother of Indian Culture. The full stature of the Indian mind is mirrored in the heritage of Sanskrit. The ambrosial rain of Sanskrit from the heavenly minds of great authors has kept the soul of the people saturated through the ages. "The copiousness of Sanskrit far exceeds that of the Greek and Latin." The doctrine of national integration through Sanskrit was preached in several ways. A national consciousness was generated by several means apotheosizing the Mother land. A conception of the holy land is found at the very outset of our civilization in the "Prthivi Sukta" of the Atharva-Veda. The process once begun continued throughout India's history as religious worship offered to the Motherland. It is found in the several Bharata-prasastis. The Prthivi Sukta itself presents a detailed scheme of motherland which was conceived as eternal goddess claiming homage of all the people settled on her soil, speaking many languages and following different faiths. We may easily recall Bankim Chandra Chatterjee's famous song "Bande Mataram" in invocation of the motherland. Sanskrit has not forsaken India through her hours of trials and tribulation. Her great scriptures have provided solidarity to the land. The Gita and Upanisads, the Vedanta philosophy and the epics form the durable foundations on which the ideals of national freedom were based. And our future reconstruction must bear the stamp of glorious Sanskrit pattern.

The Upanisads and the Sanskrit literature have propounded the lofty philosophy of Humanism that man is divine by nature and that there is divine spark in every man. If the philosophy of Humanism, as epitomized in Indian culture, is strictly and sincerely followed, there will be neither class struggle nor a clash of interest. Swami Vivekananda has rightly held the view that the Indian culture has approached Humanism following the path of spirituality and spiritual wisdom. No literature in the world has proclaimed with such an emphasis on the truth that the Divine Being resides in every being, high and low, big and small, great and insignificant. The great Swami has rightly remarked: "Secular knowledge comes with the beating of trumpets and marching of Cohorts, but spiritual wisdom comes in silence, like the dew drops in the morning silently coming down and enabling the buds of roses to blossom forth in full splendor, it drops silently and enables the man to uphold his spiritual personality, that represents the highest type in the man's edifice of personality."[5]

Dr. R.R. Mukherjee in his Presidential address, delivered at Haridwar, has rightly elaborated the fact that Indian thought speaks of three types of work in the service of man and society; the first, the physical one, that removes the physical want of the man and saves his physical life; the second, intellectual one, that eradicates illiteracy and increases work efficiency; and the third, the spiritual one, that imparts spiritual knowledge and is ranked as the highest in the scale of value. It has been now accepted by all social scientists that the modern man's greatest challenge is presented by inner impoverishment in the context of external achievements and inner insecurity in the face of external insecurity. The only solution of this is the gift of spiritual knowledge, so nicely reflected by Indian mind in all its literary creations beginning from the Upanisads down to the great poets of the classical age. Swami Vivekananda has given magnificent formula of this principle in the following words:

> "The miseries of the world cannot be cured by physical help only. Until man's nature changes, these physical needs will always arise and miseries will always be felt, and no amount of physical help will cure them completely. Ignorance is the mother of the evil and of the misery we see. Let man have light, let them be pure and spiritually strong and educated; then alone will misery cease in the world. We may convert every house in the country into a charitable asylum. We may fill the land with hospitals, but misery of man will still continue to exist until man's character changes." And Sanskrit literature beginning from Upanisads presents the material for this change in a splendid manner.[6]

Sanskrit represents the life of our land. Sorting out the eternal from the transient, integrating of new ideas from all quarters through the passage of time has been the genius of our glorious heritage. It is the duty of the intellectual section of the people in every period of time to get the past related with the present, and to see that the age-old thoughts and beliefs get integrated with the present day ideas and to see that our national legacy and basic stand are not lost in getting modernised. One of the sure ways of achieving this is to take Sanskrit and the wisdom contained in its classics to the mainstream of national life and learning. We should cultivate an holistic approach for this purpose.

Sanskrit is the embodiment of Indian culture and its importance cannot be over-emphasised. Dr. Sarvepalli Radhakrishnan, in his report of the University Education Commission, observed: 'Sanskrit as a language is an instrument of the greatest value in the delineation of all thought processes and the most profound rationalisation of all ideas which are deep and subtle, of all the forms of aesthetic and emotional perception, and above all, of the most profound and ultimate forms of spiritual intuition and understanding. The study of Sanskrit enables us to draw freely upon our tradition which can lead to the new world outlook of modern man. It helps to keep pace with the rapid social change, advances in modern science and technology and process of modernization, at the same time inculcating the right type of social, moral and spiritual values through self-discipline."

A nation like ours with its large number of languages, revival of Sanskrit should result in creating harmonising trends. Vinoba Bhave had dreamt of this by making Devanagiri as the common script. Such efforts would be in the right direction to create national integration.

K.C. Das states that, "Sanskrit is an independent language having the separate identity. It is also able to make equitable arrangements for the co-existence of diverse groups in India. It is to be remembered that richer is the language the loftier the thoughts and ideas are. We are Indians because we possess like Sanskrit which serves as an active factor of our life."

The very purpose of Sanskrit study is to know precisely the cultural history of our country as closely as possible and to connect whatever good in the past with present. Certain terms need to be redefined here in the Indian context. For example, the word 'secularism' in its basic sense refers to "pertaining to this present world." By extension it means in the western society "pertaining to things not spiritual or sacred." Hence, a secularist in west is "one who theoretically rejects every form of religious faith and every kind of religious workship." It also gained a connotation 'one who believes that education and other matters should be conducted without the introduction of religious elements'. This secularistic philosophy as adapted in various nations proved to be a total failure to bring happiness to man. Further it proved without any doubt that a society cannot exist without some values and norms for purposeful co-existence. From the Indian cultural context it has to be redefined reinforcing our values in true spirit of Indianism. Indian "secularist" should mean 'one who theoretically recognized the existence of an eternal thing and allows full freedom to define the eternal and to practise diverse religious worships at his free choice'. This 'Indian secularist' advocates that "education and other matters should be conducted against the background of Indian national ethos without however imposing any particular mode of religious worship."[7]

"It is mainly because of its capacity to change its elasticity—Hinduism has such a long history of unbroken service to mankind. It has changed many a time. Even though the fundamental truths are the same, it changed in order to accommodate the new demands of the community. The Vedic culture changed into the Puranic Culture. The Yagna-salas are no more now, but temples have come up. As a revolt against Yagna organizations, the great Buddha came. Though we kept Buddha as a separate entity in the beginning, by the time Adi Sankara came, Buddha was absorbed into Hinduism. Sankara accepted Buddha, because, 500 years before Christ that change was necessary to accommodate a new condition of society. When Buddhism which held the full sway of the country till 7th Century decayed, Sree Sankaracharya had to come and revive Hinduism. The Vedanta philosophy of Sankara could not serve the society all the time. By the 12th Century Ramanuja had to come, in the 15th century Madhvacharya had to come, in the 19th century Vivekananda had to come. When did Hinduism not change, in order to accommodate the new demands of the community? Always Hinduism had this vitality in itself."

The culture of a nation generally refers to the intellectual wealth, atmosphere, and the stage of development of its people. It is a continuously evolving, dynamic process comprising various experiences, training, and action. Music, dance, drama, literature, and other forms of artistic activities are generally taken for granted to constitute cultural heritage. On the other hand, scientific pursuits, industry, technology, etc. are not generally appreciated to form part of culture. However, it is now well recognized that scientific and technological innovations change and contribute to culture. Even in fine arts like dance, drama, and music, science and technology have introduced many devices for better performance and projection to eager audiences simultaneously and concurrently. The enormous amount of leisure provided to the community in general by mechanization of production facilities in industry and agriculture has a bearing on the cultural pursuits of its people. Do we have a cultural heritage in atomic energy? I believe we have one.[8]

Sanskrit literature provided priority to education. Knowledge has been given a vital place as can be seen from the following verse

ज्ञानं तृतीयं मनुजस्य नेत्रम् । समस्ततत्त्वार्थ-विलोकदक्षम् ।।
तेजोऽनपेक्षं विगतान्तरायम् । प्रवृत्तिमत्सर्वजगत्त्रयेऽपि ।।

Education works as a third eye to man. The difference between mere learning and development of intelligence was known to the ancients, as is clearly explained in this verse.

The teachers were a devoted class, having no other ambition except learning and teaching:

आचिनोति च शास्त्रार्थान् शिष्यान् ग्राहयते सुधीः ।
स्वयमाचरते चैव स आचार्य इति स्मृतः ।।

That was the high spiritual ideal before the students whose character-formation was the ultimate aim of education.[9] The divine qualities that constitute character have been clearly mentioned in the 16th chapter of the Bhagavadgita:

अभयं सत्त्वसंशुद्धिर्ज्ञानयोगव्यवस्थितिः ।
दानं दमश्च यज्ञश्च स्वाध्यायस्तप आर्जवम् ।।

16/1 Bhagavad Gita

अहिंसा सत्यमक्रोधत्यागः शान्तिपैशुनम् ।
दया भूतेष्वलोलुप्त्वं मार्दवं ह्रीरचापलम् ।।

16/2 Bhagavad Gita

तेजः क्षमा धृतिः शौचमद्रोहो नातिमानिता ।
भवन्ति सम्पदं दैवीमभिजातस्य भारत ।।

16/3 Bhagavad Gita

In these three slokas 26 qualities—fearlessness, purity of heart, steadfastness in the yoga of knowledge, alms giving, control of the senses, sacrifice, study of the sastras, straight forwardness, harmlessness, truth, absense of anger, renunciation peacefulness, absence of crookedness, compassion of being, non-covetousness, fortitude purity, absence of hatred, absence of pride, which give us a complete picture of the nature of a divine man. Learning and practice of these values of life thoroughly is to ensure a right way of living—leading to a perfect life in this world.

Learning is man's true wealth, his key to happiness, his best friend, his deity. A man is an animal without learning! (vidya nama narasya roopam-adhikam pracchanna-guptam dhanam . . ., etc.)" "Being a learned man and being a king are not comparable. A king is respected in his own country only. But a man of learning is revered everywhere! (vidvattvam ca nrpatvam ca..., etc.)"

Our work therefore should truly enrich human life. "Satyam, Sivam, Sundaram—Truth, Auspiciousness and Beauty" should be our aim in all our endeavors. Individuals and Institutions should go for a place for every thing, but everything in its place. We must make such knowledge available to our younger generations that would help them to grow as rounded personalities, respecting and rejoicing in dharma, or order in life. May divine grace empower us to achieve this.[10]

Even though it is true that Sanskrit language and literature are the primary sources for Indian culture, it is always a matter of doubt whether the Sanskritist of this generation is able to deliver goods for the preservation and propagation of Indian culture. The Sanskritist has to come out of his shell to join the main stream of the society which is characterized by unity in diversity in a variety of professions and vocations. Doctors, engineers, architects, lawyers, politicians, businessmen, industrialists, professionals of different skills and ages, and housewives foster and reap the fruits of culture.[11]

The Sanskritists should dedicate to the task for they have to dispel doubts and remove confusion in the science-oriented minds of the modern youth regarding various facts of the hoary past of our country. Interpolations from various texts in religious discourses and quasi-scientific interpretations to equate the modern science with the past do not fail to perplex the modern youth. Best reading materials and audio-visual tapes with abundant clarity in different regional vernaculars are to be made available. The translation norms are to be so precise and exact that the author's original ideas are exactly represented without any distortions or interpolations. Any enthusiast may read and interpret from any perspective as a sociologist, scientist, religionist, philosopher or a connoisseur.[12]

Sitanath Dey in his article, "Contribution of Sanskrit towards world civilization:" rightly comments as: At the advent of a New Millennium an intense urge is felt everywhere in the world to get peace, security and a life Divine. With a view to achieve this we are to search out what contribution Sanskrit has made to the world civilization. Sanskrit being the oldest language of the world and Vedas being the oldest literary monument, the contribution of Sanskrit is enormous towards the different aspects of world civilization—whether be it language, religion, mythology, philosophy, whether be it astronomical, medicinal, scientific and spiritual knowledge everywhere one has to take resort to Sanskrit. No country except India and no language except Sanskrit can boast of a possession so ancient and venerable; the Vedas stand alone as a beacon of Divine light for the onward march to humanity and world civilisation. All the elevated messages on human unity and integrity, world-peace and fraternity are the marvelous contribution of Sanskritic tradition to the world civilization.[13]

Surendramohan Mishra in his article, "Sri Aurobindo on Sanskrit and World Civilisation" has remarked: The genesis of human culture and civilization on earth is prominently shaped by Sanskrit in the hoary past. The Vedic message travelled to distant horizons and culminated in the major world religions and cultures. Majority of world languages also betray influence of the Sanskrit language. Sanskrit has also been the vehicle of scientific and social ideas over a very long period. Sri Aurobindo, in his writings, traces the origin of the major world civilizations to the Vedas and provides us with an atlas depicting the paths through which the essential Sanskrit culture spread to distant lands. In the modern scientific age too, Sanskrit holds the greater good to humanity in the form of spiritual unity. While savants like Einstein and Stephen Hawking speak of Adavaita in physics, realisation of the same on human plain through a collective understanding of fundamental spiritual unity of the people is the crying need of the day. Sri Aurobindo stresses upon this unity and prescribes the way which will ultimately bring about the promised society of Gnostic beings free from social and political turmoil. This will lend to the process of globalisation real credibility and offer it a purpose and an ideal.[14]

Spiritual life has been the main aim of Indian people. Indian people have more love for ethics (आचार) than power, wealth and glory. The fact that in India Philosophy has always been in quest of ethical values, that is why there has been a close link between philosophy and religion. All these values are enshrined in our Ancient Sanskrit Literature e.g. Vedas, Mahabharata, Ramayana, Bhagavad Geeta, Dharmsastras., etc. John Kenneth Galbraith in his book, The Affluent Society (4th Ed), New York New American Library, 1994 has remarked about the people of USA who are lost in dollars and wasting life. To quote:

We live, then, in a "wealthy" country—what nowadays has been called an "affluent society." This means not only that we have much material wealth, but that we want this wealth more than we want anything else. This ordering of priorities has brought our civilization to the brink of ruin. We know we must find a way out, a way back to values and priorities that represent the real, whole nature of man. But all the ways that were once intended to help us find our authentic well-being and our authentic responsibility are themselves deeply stained by the money question. Religion, education, the pursuit of scientific knowledge, medicine, government, as well as most of our day-to-day relationships, have also been surrounded and captured by our compulsion for material wealth—and especially our fascination with the instrument we have invented in order to facilitate the acquisition and distribution of wealth, namely, money.

3. SANSKRIT AND OTHER LANGUAGES

The Government of India, declared the year Yugabda 5001 (2000 A.D.) as the "Sanskrit Year." Throughout the length and breadth of our country, it was taken as a great event both by individuals and institutions working for the propagation of Sanskrit, the invaluable treasure of our great country admired by the intellectuals all over the globe. We gratefully remember the following inspiring words of Dr. Murli Manohar Joshi:

> "We are fully convinced that Sanskrit, with its rich vocabulary and flexibility in the formation of words and phrases, is the mother of most of the languages in the world. We can trace the influence of Sanskrit not only on all the Indian languages but also on the languages in Europe and South-East Asia. If we cast our critical eyes on the different Indian languages then we discover that more than 75-80% of the words used in most Indian Languages originate from Sanskrit. Learning of Sanskrit cannot be in isolation. We have to take note of the mass of knowledge that is being produced in Science and Technology affecting the lives of the people like never before. All this should necessarily find place in the Syllabus of Sanskrit Studies."

Raghunath Panda in his article, "The role of Sanskrit Language in Management of Cultural Diversity" in Jagannath Sanskrit University *Journal of Indology*, Vol. 7, 2002 aptly remarks that, "Literature of all modern Indian languages are overwhelmingly influenced by the rich and fabulous vocabulary and structure of this encyclopaedia language Sanskrit. An independent vernacular grammar is almost impossible to think of regarding all north Indian languages which are of Indo-European origin. Even foreign languages like Newari or Nepali and Singhalese come under this condition through the southern languages are known as of Dravidie origin, they owe from 50-70 percent of their word stock to the Sanskrit language. Urdu which does a part of its vocabulary to Arabic and Persian has all its roots from Sanskrit alongwith a greater chuck of the vocabulary . . . thus Sanskrit has a very important role to play in management of linguistic diversities in the present and future India."

Regarding the Study of Sanskrit it may be added that though the production, preservation and study of this comprehensive literature has been going on down the ages, in the pristine traditional manner, it has only been during the last two hundred years that an all round interest and world-wide awakening about it has occurred. In fact, 'Indology', which, includes, Sanskrit, might be said to have commenced as a modern academic discipline only by the founding in 1784, of the Asiatic Society of Bengal, at Calcutta, by Sir William Jones, and the virtual launching of the discipline of comparative linguistics in Indo-European with the following declaration made by them before the Society in 1786.

The Sanskrit language, whatever be its antiquity, is of wonderful structure; more perfect than Greek, more copious than Latin, and more exquisitely refined than either; but bearing to both of them a stronger affinity both in the roots of verbs and the forms of grammar than could possible have been produced by accident; so strong indeed that no philologer could examine them at all without believing them to have sprung from some common source, which perhaps no longer exists. There is similar reason though not so forcible, for supposing that both

Gothic and Celtic, though blended with a different idiom, had the same origin with Sanskrit; Gothic and the Old Persian might be added to the same family.

Nandita Basu in her article, "Sanskrit: The Glory of Modern Civilisation" presented to the World Sanskrit Conference 2001, New Delhi, talks about the richness of Sanskrit language. The debt which the world owes to our country to Sanskrit language is immense. If we look back upon the history of our country we do find the contribution of Sanskrit is present in every corner of Indian culture, religion, history, literature, music, etc. Even more in mathematics, geometry, astronomy and the very cornerstone of all present civilization were discovered in India are in reality, Sanskrit words. Our Sanskrit language is now universally acknowledged to be the foundation of all European languages. So the influence of Sanskrit language has fallen upon the world like gentle dew which yet bringing into bloom the fairest flowers of the earth.[15]

Suniti Kumar Chatterji in his preface to Volume IV of the Cultural Heritage of India affirms that the Sanskrit language and contents have been adopted by other Indian languages. Just as water falling from the sky goes to the sea, so the salutations offered to the various gods reach God alone (Akasat patitam toyam yatha gacchati sagaram; sarva-deva-namaskarah Kesavam pratigacchati).

This Sanskrit saying is echoed in most languages in India which still carry on the traditions of Hindu culture. It conveys a sentiment that is understood and immediately subscribed to by most people in India, and certainly by all Hindus; and it indicates one of the fundamental attitudes in Hindu culture—its great sense of understanding and hospitality. This basic mentality is very old in India—as old as the Vedas. One of the commonplaces in the Indian mental make-up is the sentiment expressed in that great passage from the Rg. Veda, 'Ekam sad, vipra bahudha vandanti—That which is, is One; sages describe it in manifold ways.[16]

Samarendra Nath Sen in his article, "India and the Ancient World: Transmission of Scientific Ideas" has highlighted the contribution of India to knowledge. To quote him:

From very early times India was aware of these geo-economic features which tended, on the one hand, to isolate the country and encourage its own cultural pattern and, on the other, to provide a strong motivation to break this isolation through trade and other international exchanges. (S.N. Sen, 'Trade Routes and the Transmission of Scientific Ideas between India and Central Asia, paper read at Indo-Soviet Seminar in Bombay in November 1981 under the auspices of the Indian National Science Academy). The awareness of these geo-economic features along with their advantages and disadvantages is reflected in a number of passages of the Rg. Veda, Atharva-Veda, Buddhist Jatakas, and Arthasastra of Kautilya. (R.V.X.144; and A.V.XII, I, II mention geographical features, about the skill and daring of Indian merchantmen, vide R.V., I. 25.7; 56.2; 116.3; VII. 88.3. For periodical commercial voyages to Baveru of Babylong.

The Brahmi scripts as the vehicle of the Sanskrit language spread throughout the length and breadth of India and followed the language to Central Asia, Tibet, Mangolia, and elsewhere. Brahmi inscriptions on didactic matters and deeds of gifts have been found in Kara Tepe in Afghanistan and in Dilverdzhina in northern Afghanistan. Merv, in Soviet Central Asia, has yielded the Vinya text of the Sarvastivada school —nearly 200 leaves in Brahmi and dated about the fifth century A.D. In the Tarim basin the adoption of the Brahmi script followed the growing popularity of Sanskrit there. The script was also adopted for writing Tokharian B. the language of Kucha, Tokharian A, the language of Karashar of Agnidesa, and Saka-Khotanese.[17] (Mukherjee, *op. cit.*, p. 705) Sanskrit manuscripts in Brahmi, written on birth bark, palm leaves, leather, and paper have been excavated from a number of sites in the Tarim basin—Kucha, Tumshuq, Turfan, Tung-huang, Khotan, and Kashgarh. Hiuen Tsang noticed the use of the Brahmi script in Karashar, Kucha, Kashgarh, Khotan, and Yarkand and observed that the script had been taken from India and modified as necessary in different places, indicating that by the seventh century A.D. the script had attained considerable popularity in Central Asia.[17]

It is a matter of great pride that other Indian languages have borrowed tremendously from Sanskrit. However, in the present age, there is a need to make Sanskrit simpler and popular. Only then, it will become the language of masses. We need publications of Sanskrit which can be used by scientists, scholars, medical personnel, engineers, lawyers. In this way Sanskrit language would be developing very fast as it would become essential for all types of people.

Sanskrit is not only being taught in India but in many countries of the world especially South East-Asia. Its documents have been translated in many languages. Bhagavad Gita and Mahabharata have been translated in most of the languages. The Union Ministry of Human Resource Development, Govt. of India, has assigned importance of Sanskrit and other languages as an integral part of National Policy of Education 1986. The 1986 Policy has said in this regard as below:

> "Research in Indology, Humanities, and Social Sciences will receive adequate support. To fulfil the need for the synthesis of knowledge, inter-disciplinary research will be encouraged. Efforts will be made to delve into India's ancient fund of knowledge and to relate it to contemporary reality. This effort will imply the development of facilities for the intensive study of Sanskrit."

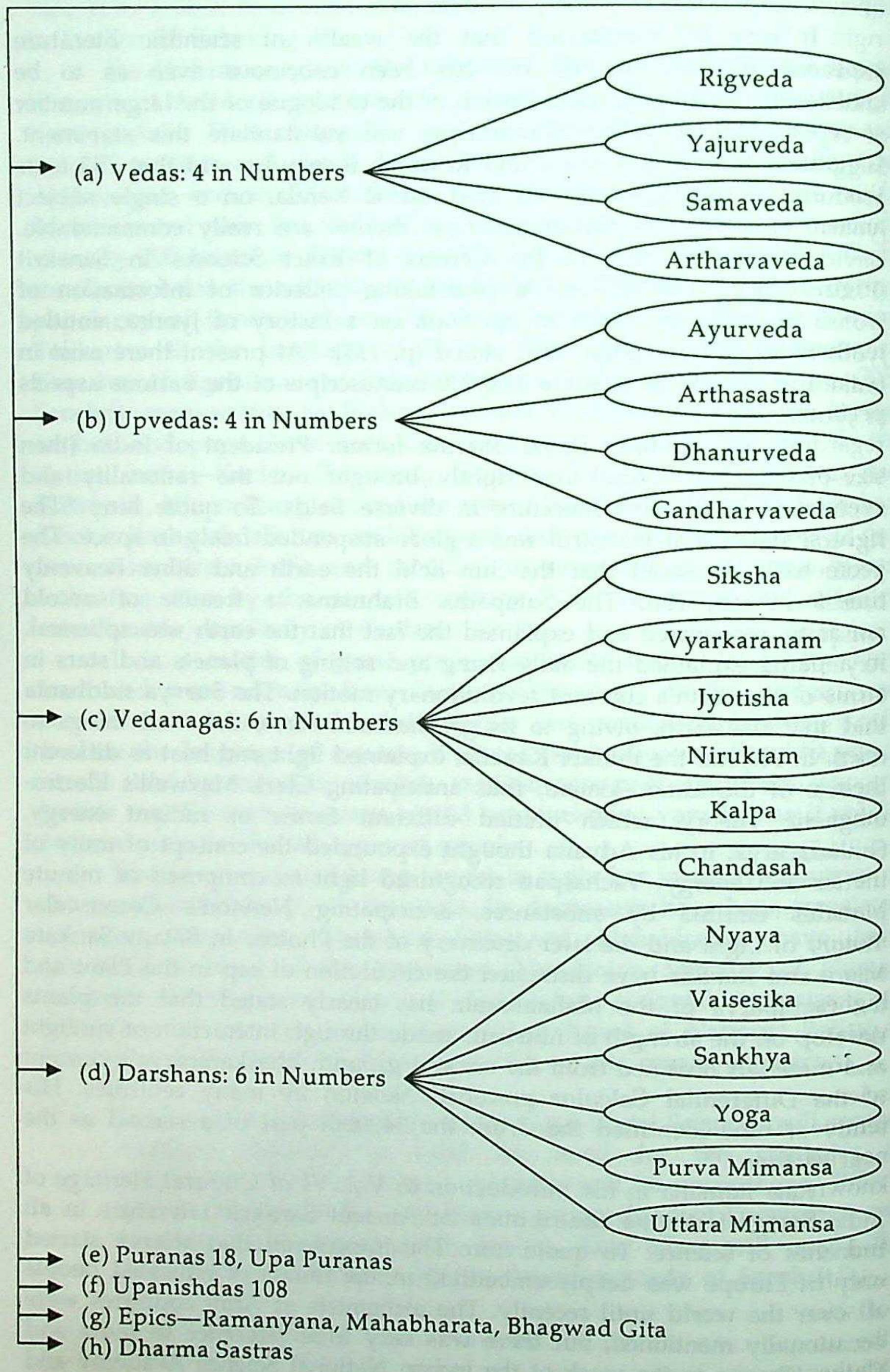
4. SANSKRIT REPOSITORY OF WEALTH OF SCIENTIFIC KNOWLEDGE

It may be maintained that the wealth of scientific literature produced in India in Sanskrit has been enormous even as to be unbelievable. Indeed an examination of the catalogue of the large number of repositories of Indian manuscripts will substantiate this statement. Suggesting the lines of study and Research it may be said that 752 texts produced in the tiny strip of land called Kerala, on a single subject Jyotisa, and registers the manuscripts thereof are really commendable. David Pingree, author of the Census of Exact Sciences in Sanskrit (Philadelphia, 1970 ff.) and a painstaking collector of information of Jyotisa manuscripts, states in his book on a history of Jyotisa, entitled Jyotis Shastra. Wiesbaden, 1981 stated (p. 118): "At present there exist in India and outside of it, some 1,00,000 manuscripts of the various aspects of Jyotishsastra."[18]

Late Dr. Shankar Dayal Sharma former President of India (then Vice-President of India) has rightly brought out the rationality and application of Sanskrit literature in diverse fields. To quote him: "The Rgveda stated that the earth was a globe suspended freely in space. The Vedic texts disclosed that the Sun held the earth and other heavenly bodies in its orbit. The Satapatha Brahmana, a treatise of untold antiquity, recognized and explained the fact that the earth was spherical. Aryabhatta explained the daily rising and setting of planets and stars in terms of the earth's constant revolutionary motion. The Survya siddhanta said that the earth, owing to its gravitational force, draw all things to itself. In Physics the thinker Kanada, explained light and heat as different aspects of the same element, thus anticipating Clark Maxwell's Electro-magnetic Theory, which unified different forms of radiant energy. Sankaracarya, in his Advaita thought expounded the concept of unity of matter and energy. Vachaspati recognized light as composed of minute particles emitted by substances, anticipating Newton's Corouscular Theory of Light and the later discovery of the Photon. In Botany Sankara Misra and Kanada have discussed the circulation of sap in the Plant and the Santiparva of the Mahabharata has clearly stated that the plants develop on the strength of nutrients made through interaction of sunlight and materials obtained from the air and ground. Bhaskaracarya's concept of the Differential Calculus preceded Newton by many centuries. His study of time identified the Truti: the 34000th part of a second as the unit of time."[19]

Raja Ramana in his Introduction to Vol. VI of Cultural Heritage of India brings forth the contribution of Ancient Sanskrit Literature in all branches of science. To quote him: The impression that science started only in Europe was deeply embedded in the minds of educated people all over the world until recently. The alchemists of Arab countries were occasionally mentioned, but there was very little reference to India and China. Thanks to the work of the Indian National Science Academy and

Important Ancient Sanskrit Literature Comprises of:



- (a) Vedas: 4 in Numbers
  - Rigveda
  - Yajurveda
  - Samaveda
  - Artharvaveda
- (b) Upvedas: 4 in Numbers
  - Ayurveda
  - Arthasastra
  - Dhanurveda
  - Gandharvaveda
- (c) Vedanagas: 6 in Numbers
  - Siksha
  - Vyarkaranam
  - Jyotisha
  - Niruktam
  - Kalpa
  - Chandasah
- (d) Darshans: 6 in Numbers
  - Nyaya
  - Vaisesika
  - Sankhya
  - Yoga
  - Purva Mimansa
  - Uttara Mimansa
- (e) Puranas 18, Upa Puranas
- (f) Upanishdas 108
- (g) Epics—Ramanyana, Mahabharata, Bhagwad Gita
- (h) Dharma Sastras

other learned bodies, the development of science in India during both the ancient and medieval periods has recently been studied. It is becoming right from Vedic to modern times with the usual fluctuations that can be expected of any country. In fact, I do not find an example of a civilization, except perhaps that of ancient Greece, which accorded the same exalted place to knowledge and science as did that of India. There is nothing that bears comparison to knowledge (nahi jnanena sadrsam): this epitomized our culture's homage to learning and inspired our ancients quest for knowledge.[20]

Bibhutibhushan Datta in his article, "Vedic Mathematics traces the origin of Mathematics from Ancient Sanskrit Literature. To quote him:

Vedic Hindus evinced special interest in two particular branches of mathematics, viz. geometry (sulva) and astronomy (jyotisa). Sacrifice (yajna) was their prime religious avocation. Each sacrifice had to be performed on an alter of prescribed size and shape. They were very strict regarding this and thought that even a slight irregularity in the form and size of the altar would nullify the object of the whole ritual and might even lead to an adverse effect. So the greatest care was taken to have the right shape and size of the sacrificial altar. This originated problems of geometry and developed chiefly out of the necessity for fixing the proper time for the sacrifice. This origin of the sciences as an aid to religion is not at all unnatural, for it is generally found that the interest of a people in a particular branch of knowledge, in all climes and times, has been aroused and guided by specific reasons. In the case of the Vedic Hindu that specific reason was religious. In the course of time, however, those sciences out grew their original purposes and came to be cultivated for their own sake. The Chandogya Upanisad (VII.1.2.4) mentions among other sciences the science of number (rasi). In the Mundaka Upanisad (1.2.4.5) knowledge is classified as superior (para) and inferior (apara). In the second category is included the study of astronomy (jyotisa). In the Mahabharata (XII.201) we come across a reference to the science of stellar motion (naksatragati) the term ganita, meaning the science of calculation, also occurs copiously in vedic literature. The Vedanga Jyotisa gives it the highest place of honour amongst all the sciences which form the vedanga. Thus, it was said: As are the crests on the heads of peacocks, as are the gems on the hoods of snakes, so is the ganita at the top of the sciences known as the Vedanga. (Yatha sikha mayuranam . . .) At the remote period ganita included astronomy, arithmetic, and algebra, but not geometry. Geometry then belonged to different group of sciences known as kalpa.[21]

Remella Avadhanulu in his article concepts of Computer compilers and other Modern Sciences in Vedic Literature mentions as: Several scientists like Einstein, Laplace and Knuth conducted unbiased analysis of scientific contents of Sanskrit Literature, and expressed admiration for the unique contributions of our ancestors. Their studies were mostly on Mathematics, Chemistry and Astronomy. But it is not known whether.

anybody explored for scientific contents of Mimamsa Sastra. Several scientific aspects of Computer Software were observed in Mimamsa almost in the same form. The approach of compilers in translating the statements of Computer languages is found to closely follow the approach of Mimamsa in its Vakyartha Vicarana. It is also observed that certain aspects, which are well established in Mimamsa are not yet implemented in Computers. Similarly, several hundred mantras are identified which are closely related to the scientific subjects like Physics, Space Science, Biochemistry and Microbiology. The study resulted in publication of two books, viz. 'Vedas and Computers', and 'Modern Sciences in Vedas—an Index'. It also established the need for a detailed research of our ancient texts in Sanskrit language for furtherance of modern computers and other latest technologies.[22]

B.V. Subbarayappa in his article, "Sanskrit and Indian Scientific Thought" stated: Indian Science and Sanskrit are inseparable, since Indian scientific concepts, be they in astronomy, mathematics, medicine and even biology, have been succinctly expounded in Sanskrit over the millennia. The Vedic literature has such seminal concepts as the natural law (rta), 'the light infinite', sacrifice (yajna) as a medium of celestial terrestrial correspondence and the pluralistic but holistic doctrine of five elements (pancabhutas). The Vedangas and the Nyaya-Vaisesika as well as the Samkhya literature provide certain important scientific models in an unambiguous manner. There is a large body of scientific literature in Sanskrit specially relating to astronomy, mathematics and medicine. Apart from the precise technical words in Sanskrit, there are certain innovations in respect of the presentation of numbers and mathematical operations.[23]

Shamasundar, S. in his article, "Science in Chandogyopanisad states: Science and technology are mutually connected. Sometimes science results in technology and often technology drives science. While the pursuit of science is more fundamental and basic understanding of the universe, technology strives of making systems that work for the comfort and convenience of mankind. The process of science begins with an observation of nature and understanding how things work. Observation, experimentation, drawing inferences, comparing with earlier knowledge (documented or otherwise), forming logical/mathematical formulations, validating the inferences, and finally drawing conclusion are the typical steps known in the practice of science. The ancient Indians have recorded and practiced the basic principles of scientific process as enumerated above. This is reflected in various darsanas and also in Yogasutra. All the Indian scriptures and epics have some form of scientific and technical information embedded in them, some explicitly and implicitly. Caution should be taken to derive appropriate conclusions without any prejudices. The Chandogya Upanisad (CU) a part of Samveda, is taken here as a case study for analysing the scientific and technological content of Upanisadic age in India. The chapter seven of CU lays the importance

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of Vijnana (Science) and describes the various streams of sciences. There are several examples of experimentation involving plants and trees, chemicals and on the body of the student itself. There is an indication of the knowledge of geology, fisheries, climatologic, human anatomy and zoology. There are explicit references to some understanding of materials science, and materials technology. Interestingly, CU notes that human beings are also a form of animals and describes the procreation process. The process of perception of human brain and the linkage of perception to sensory organs are clearly described. Extensive references to cosmology, astronomy, and astrology are found repeatedly in several chapters. References to music, acoustics and musical instruments (veena) are found, which imply the knowledge of wood working as well as metal working. It is apparent from the study of Chandogya Upanisad that the Hindus in that period had a great deal of understanding of various sciences and technologies.[24]

> "India—the land of Vedas, the remarkable works that contain the fact which science has proved true. Electricity, radium, electronics, airship, all were known to the seers who founded the Vedas."
>
> —*Wheeler Wilcok*

The whole world is today witnessing unprecedented developments especially in the field of Science and Technology that has been constantly endeavoring to scale the heights of knowledge. Scientists and researchers around the world are celebrating and welcoming the new millennium and the new century with the hope that it would usher in a world beyond recognition. In the march of time, man has traversed from abacus to enormous speed computers, from natural herbs to medical electronics, from horse-drawn carriage to interplanetary spacecraft, etc. the phenomenal development in retrospect can be seen as an interpretation of man's past in the light of his ideal development. In this respect, India's contribution cannot be discounted, especially our achievements and our capacious role in various discoveries and inventions that had taken place, at an early stage, in this land of spiritual sages and philosophers. Unlikely any other country, India had identified and understood the importance of science in a meaningful way towards the overall development of people and the society, thousands of year back. This can be well corroborated from the great epics of Hindus, where there is reference of Pushpak Viman in Ramayana which could be nothing but a prototype of airplanes or of Divyastra which forecasts the advanced technology of missiles or Sanjaya acquiring the Divya-Drishiti in Maharashtra that could be taken to mean nothing less than a sophisticated communication system of the present era. This all shows that in ancient times, science in India was far ahead in comparison with its state today in the west.

In Indian languages, the science of Astronomy called Khagolashastra, is one area that has fascinated all mankind since the very beginning. In India the first references to astronomy is dated around 2000 BC. In ancient times, giant personalities like Aryabhatta, Brahmagupta, Bhaskaracharya and Varahamihira were associated with Indian astronomy. Many Indian astronomers had confirmed that the stars are same as the Sun. one of the Sanskrit shlokas even states, "Sarva Dishanaam, Suryaha, Suryaha, Suryaha", i.e. in all directions there are suns in the night and that the Sun is also a star, though the nearest one. Around Seventh Century, Brahmagupta estimated the circumference of the earth 5000 yojanas, where one yojana is around 7.2 kms which is quite close to the actual figures, estimated today. In the Fifth Century, Aryabhatta was the first one to have propounded the theory that the earth is a sphere.

Indian medical tradition also goes back to Vedic times when the medical practitioners were given the status of God. Dhanvantari, who is assumed to be the God of Medicine, was the earliest to study medicines in India. In his book, "The Vedic Gods", B.G. Rele has even commented, "Our present knowledge of the nervous system fits in so accurately with the internal description of the human body given in the Vedas. Then the question arises whether the Vedas are really religious books or books on anatomy of the nervous system and medicine." It is to feel proud that the very first surgery was performed in India around 800 B.C. In the fourth century, Sushruta, who can well be called the Father of Surgery, was equipped with superb surgical skills, first studied human anatomy and had acclaimed success in various kinds of surgery. He was the first one to implement the techniques of plastic surgery and extraction of cataracts. In his book, "Sushruta Samhita", apart from various methods of operations, about 125 surgical instruments are listed. In his time, he is believed to have performed even a Caesarean operation. Ayurveda the earliest script of medicine, is an indigenous system of medicine that is exclusively based on herbs; it lists the diseases, their diagnoses and cure. Charaka, a noted practitioner of Ayurveda in ancient India was the first physician to present to the concept of digestion, metabolism and immunity in the First Century AD, in his famous Ayurvedic treatise Charaka Samahita. From his script, it could be seen that he knew even the methods of detecting the sex of an unborn child.[25]

James Jeans in his article, 'Mysterious Universe' says thus: "The outstanding achievement of 20th century physics is not the theory of relativity with its welding together of space and time or the theory of Quantum with its apparent negation of the laws of causation or the dissection of the atom with the resultant discovery that things are not what they seem. It is a general recognition that science has not yet been in contact with ultimate reality.

H.C. Dudley observed, "when Einstein's famous equation $E=MC^2$ was first proposed, it was considered an interesting speculation, not a proven theory. But it is difficult to disprove the equation. It is true that ether did not enter into the composition either of relativity theory or the Quantum mechanics. But it is equally true that both the theories explain the physical phenomena in a sound manner."[26]

Even Kekule thought of the formula of Benzene in a dream on which whole of Organic Chemistry is based. (Benzene)

To uplift the standard of living of masses of our people, the Government of India and State Governments have put in great efforts based on foreign technology and ideology. Slowly and slowly, we started using our own literature. However, these efforts would succeed only, if cultural aspects of activation and management based on ethical values involving human aspects are properly understood. The benefits of science as stated in Ancient Sanskrit Literature, need be used in positive development and not for destruction. The purpose of science and technology in Ancient Sanskrit Literature was the pursuit of real happiness by the people.

5. SANSKRIT LITERATURE AND PURPOSE OF LIFE

Every system of Indian philosophic thought gives us a practical way of reaching the supreme ideal. Though we begin with thought, our aim is to go beyond thought to the decisive experience. Systems of philosophy give not only metaphysical theories, but also spiritual dynamics. It may be argued that, if man is a part of the Divine, what he needs is not redemption as an awareness of his true nature. If he feels himself a sinner estranged from God, he requires a technique by which he reminds himself that he is essentially a part of God and any feeling to the contrary is illusory. This awareness is not intellectual but integral; so man's whole nature requires overhauling. The Bhagavadgita give us not only a metaphysics (brahmavidya) but also a discipline (yogasastra). Derived from the root, yuj, to bind together, yoga means binding one's psychic powers, balancing and enhancing them. By yoking together and harnessing our energies by the most intense concentration of personality, we force the passage from the narrow we go to the transcendent personality. The spirit tears itself away from its prison house, stands out of it and reaches its own innermost being.

The Gita gives a comprehensive yoga-sastra, large, flexible and many-sided, which includes various phases of the soul's development and ascent into the Divine. The different yogas are special applications of the inner discipline, which leads to the liberation of the soul and a new understanding of the unity and meaning of mankind. Everything that is related to this discipline is called a yoga such as jnana-yoga or the way of knowledge, bhakti-yoga or the way of devotion, karma-yoga or the way of action.[27]

Yoga or occultism is a vision of reality and those who have visualized it are known as Yogis. Fragments of this vision are presented in Yoga manuals, which are later interpreted and put into some sort of order by their disciples. Intuition is the chief instrument of a Yogi to visualizes reality. Scientists also do use intuition but distrust it until justified by observation or preferably by experiments. But the Yogi on the other hand, develops intuition into a real faculty of knowledge, for the whole system of occult training is designed to that end when intuitive knowledge develops or the sixth sense opens, it extends its range of observation far beyond that of science. It is this expanded vision which the Yogi uses intelligently.[28]

Jagdish Chandra Basu, himself a famous scientist, made the following remark, "This I know that no vision of truth can come except in the absence of all sources of distraction and when the mind has reached the point of rest."

Sanskrit is not only being taught in India but in many countries of the world especially South East-Asia. Its documents have been translated in many languages. Bhagavad Gita and Mahabharata have been translated in most of the languages. The Union Ministry of Human Resource Development, Govt. of India, has assigned importance to Sanskrit and other languages as an integral part of National Policy of Education 1986.[29]

The 1986 Policy has said in this regard as below:

"Research in Indology, Humanities and Social Sciences will receive adequate support. To fulfil the need for the synthesis of knowledge, inter-disciplinary research will be encouraged. Efforts will be made to delve into India's ancient fund of knowledge and to relate it to contemporary reality. This effort will imply the development of facilities for the intensive study of Sanskrit."

The most important function of Ancient Sanskrit Literature is the development of self (योगः कर्मसु कौशलम्) i.e. Doing one's job in an excellent way with devotion, dedication and competence is the source of happiness, bliss and growth. Work is its own reward. Vedas in ancient India satisfied the needs of the intellect, of the imagination of the emotions, of the ethical values, of a great nation for a long period extending over at least three thousand years, and the records of that nation in the fields of intellect and wisdom are not below the achievements of any other nation that has appeared on the fact of the earth till now. However, in recent times because of the impact of imperialism and slavery, we could not recover so far to our golden era when people worked based on spirituality and common good.

The common good, then, consists primarily of having the social systems, institutions, and environments on which we all depend to work in a manner that benefits all people. Examples of particular common goods or parts of the common good include an accessible and affordable public health care system, and effective system of public safety and security, a just legal and political system, and a flourishing economic system. Because such systems, institutions, and environments have such a powerful impact on the well-being of members of a society, it is no surprise that virtually every social problem in one way or another is linked to how well these system and institutions are functioning.

We can regain our golden era, as stated in the cultural Heritage of India (2001, Vol. I, p. 365). The goal as well as the way has been pointed out to us by the Upanisads: Know that one Atman alone, and give up all other talk. This is the bridge to immortality. It is now left to us to move on. Let us not be overwhelmed with the thought that we are powerless. Are we not potentially the infinite spirit whose glories even the Vedas can at best only indicate negatively by the method of neti neti (not this, not this)? In the words of Swami Vivekananda, This infinite power of the Spirit brought to bear upon matter evolves material development, made to act upon thought evolves intellectuality, and made to act upon itself makes of man a god. We must struggle patiently, perseveringly. The well-being of the modern world depends on a proper understanding of the Upanisadic teachings and on their sincere application to the practical problems of our daily life. This only can materiality, which is the common enemy of the world, be conquered, and love, instead of hate, be our guiding principle. Even age-long darkness, as Sri Ramakrishna used to say, disappears as soon as a light is brought in. It behaves us, like true followers of the Upanisads, to assert our birthright and, armed with the strength of realization, make a determined effort to establish the reign of peace and harmony on earth.

Institutions of national importance engaged in Sanskrit Research, Teaching and Propagation:

I. Rashtriya Sanskrit Sansthan

First and foremost institution of National Importance is "Rashtriya Sanskrit Sansthan established in October 1970 as an autonomous apex body under the Ministry of Human Resource Development, Govt. of India with a view to promoting, preserving and propagating Sanskrit bearing, in all its aspects. In addition to conducting the regular courses in all its constituent vidyapeethas, it has been bringing out publications of great significance at a low cost for the benefit of readers. In its silver jubilee year, 1995, 25 books were published of eminent scholars.

Research work of Sanskrit scholars have been published by the Sansthan. Some of them are specially mentioned in alphabetical order: "Valmiki Ramayanam—Kamba Ramayanam Ca" by Pt. Adya Charan Jha, "Mahakavi Vidhyapathi" by Prof. Jayamanta Mishra, "Manusatvad Daivikam Prati" by Dr. K.P.A. Menon, 'Dvaita Vedanta Darsana of Madhavacharya" by Prof. K.T. Pandurangi, "Sanskrit Gadya Sahitya" by Dr. Kananath Shastri, "Sabbda Laksana-Pramanya-Vimarsah" by Prof. N.S.R. Tatcharya, "Introduction of Puranas" by Prof. Pushpendra Kumar, "Vaidic Akhyana" by Prof. P.N. Kawthekar, "Sri Aravinda on Vedic Deities" by Dr. R.R. Mukherjee, "Caraka Samhita—A Sample Survey" by Dr. R.K. Sharma, "Sanskrit Drama in Theory and Practice" by Dr. S.S. Janaki, "Legends in Puranas" by Prof. S.G. Kantawala, "Tadeva

Ganganam Saiva Dhara" by Prof. Shrinivasa Ratha, "Contribution of Mithila to Sanskrit Kavyas and Sahitya Sastras" by Dr. Triloke Nath Jha, "Upanisadah Ekah Paricayah" by Prof. V. Kutumba Shastri, "Acaryo Dandi" by Dr. Yogeshwar Datta Sharma, etc. are the beautiful flowers of the Rajata Jayanti Grantha Mala.

With the financial assistance of the Sansthan, during the year 1996, following works have been published: Prabandha Kusumanjali of Dr. Jayamanta Mishra, Samasa Skti Nirupana by Dr. Banamali Vishval, Sankara Mishra's "Vadi Vinoda" edited by Dr. Vishvambharanath Giri, Syamananda Racanavali edited by Dr. Kishoranath Jha, Tarkabhasa with the commentary of Ganesh Diksita, edited by Dr. P.N. Shastri.

In addition Kendriya Sanskrit Vidyapeethas are also publishing their own work.

2. Bhartiya Vidya Bhavan

Bhartiya Vidya Bhavan has been running a number of courses in Sanskrit, Indian Culture, Art and Culture, Archeology, Vastu Shastras throughout the country. Many of the courses are recognized by the Foreign Universities. These courses are putting the stamp of Indian culture on the minds of the participants.

3. Bhandarkar Oriental Research Institute, Poona

It is a research institute which has done tremendous work in the area of Sanskrit. Many important publications have been done - Dr. A.M. Gahatoje has compiled "A comprehensive and critical dictionary of the Prakrit language" Dr. S.D. Joshi has compiled, Encyclopaedia of Sanskrit Dictionary on Historical Principles. Prof. J.A.F. Rood Bergen conducted research on Panini and Patanjli, S. Mahabhasya is also of great significance. The institute attracts foreign scholars. Author visited this institute and found this institute a store house of rare books. The institute is also bringing out a research journal which is held in high esteem.

4. Ramakrishna Order

It was set-up in 1897. It has expanded both in magnitude and direction. There are more than 150 official centers of Ramakrishna order and many more unofficial. Many centers have been set abroad as well. The Ramakrishna order publishes and propagates ancient Sanskrit literature through its centers. Cultural Heritage of India, 2001 in six volumes is of great significance.

5. Central and State Universities

Shri Lal Bahadur Shastri Rashtriya Sanskrit Vidyapeeth, New Delhi and Rashtriya Sanskrit Vidyapeeth, Tirupati deemed universities are doing both teaching and research. These universities have published excellent publications. Besides, Sampurnananda Sanskrit University, Varanasi, Kameshwar Singh Darbhanga Sanskrit University, Darbhanga, Shri Jagannatha University, Puri are contributing a great deal for research and teaching in Sanskrit.

6. Sahitya Academies

Sahitya academies, New Delhi and in many other states are also bringing out books based on research. Besides felicitation volumes are also published from time to time.

The Uttar Pradesh Sanskrit Sansthan, Lucknow, besides doing an excellent work is bringing out History of Sanskrit Vanmaya in 18 volumes (Chief Editor Acharya Pt. Baldev Upadhyaya.)

Chinmaya International Foundation, Eraculum, The Oriental Institute, Baroda, the Academy of Sanskrit Research at Melkote in Karnataka, The Rashtriya Veda Vidya Pratishthana, Delhi, Vishvehvaranad Vishav Bandhu Institute of Sanskrit and Indological Studies, Hoshiarpur, the Centre of Advanced Study in Sanskrit in the University of Poona are doing good work.

Besides these there are hundreds of institutes which are doing good work but it is difficult to mention all of them.

However, most of the universities in India have Sanskrit departments which are engaged both in teaching and research. They can be of great help in inter-disciplinary research both science and social sciences, etc. University intelligentsia may be assigned definite projects to analyse the unprinted literature and publish it.

Professor K.N. Pathak, Vice-Chancellor, Panjab University at the inaugural session of the National Seminar, "Science, Society, Values and Consciousness" held on 27th May, 2002 at Panjab University, Chandigarh remarked that:

We as citizens of this country cannot remain aloof from sharing the concern of any other country in the world about the prevailing situation calling for overall consciousness on the part of our countrymen about our ancient values (as against the western culture) which could ultimately prove to be a panacea for all ills of the society. These values could be inculcated only at the formative stage of any generation through proper education. Hence, the universities, besides other educational institutions, will have to play their roles very sincerely, sensibly and effectively, for a university is the place where dissemination of ideas takes place, the future of the nation is being nurtured, feelings of nationalism blossom, socio-economic changes become possible and public consciousness awakens. If the future of a nation unfolds itself in the lap of the mother, then the universities and educational institutions are looked upon as the precincts where the future of the citizens of a nation develops and attains a state of purity under the able guidance, supervision and direction of a guru.

An interesting development is the interest in Sanskrit literatures in Western Europe and North America. Francis X and S.J. Cloomey in their article, "Reading Vendanta at the end of the Twentieth Century" in Living Wisdom, Vedanta in a World Community (i.e. Pravrajika Vrajaprana. (Madras, Shri Ramakrishna Math, 1996, pp. 144-45) stated that one of the great intellectual and spiritual events of the second half of the twentieth century in the "West" (i.e. Western Europe and North America) has been the astonishing advance in the publication, translation, and study of non-Western texts (and, in appropriate ways, of non-Western art, music, ritual, etc.), and the dissemination of this knowledge in universities, seminars, research and spirituality centers, schools, local cultural and religious organizations, and more generally throughout popular culture.

An increasing number of important Sanskrit and vernacular language texts related to Vedanta are being edited and published—the great commentaries, but also many sub-commentaries and independent treaties, including lengthy and difficult works such as Suresvara's Vartikas on the Brihadarnayaka and Taittiriya Upanisad Bhasyas, and even further commentaries on those Vartikas. There are now commonly available fine translations of the Upanisads, the Brahma Sutras, and the works of Shankara and many later Advaitins. Nor are other schools of Vedanta neglected. For instance, in the 1980s there began appearing fine new critical editions of Ramanuja's Sri Bhasya and related Vishishtadvaita works. Most of the Tamil and Sanskrit works of Vedanta Desika and Pillai Lokacharya have been printed or reprinted, and many of these have appeared in translation. There is also an increasing interest among scholars in the Tamil devotional works which are fundamental to Ramanuja's understanding of Vedanta. Similarly, we find an increasing range of good translations of the works of other Vedantins such as Madhva and Vallabha.

A brief resume of Sanskrit teaching research and propagation would be of great use to the readers. However, we may suggest here the problems faced by the Sanskrit institutes and scholars and their probable solutions.

1. Lack of Specific Policy for Development of Sanskrit

The Ministry of Human Resource Development, Govt. of India, New Delhi, though very keen to promote Sanskrit from all aspects but its policies are not clear resulting into wastage of funds and little achievement like the Adult Education Programme. The Ministry should not distribute grants only but develop mechanism to monitor the results. A discussion with the institutes running a course for spoken Sanskrit revealed that it is not running well.

2. Lack of Co-ordination among Research Institutes in Sanskrit: Causing Wastage

There is lack of co-ordination among research institutes and universities. It appears that they are working in isolation. The Rashtriya

Sanskrit Sansthan should be made co-ordinating agency where all research material published throughout the country is made available.

3. Lack of Co-ordination between Sanskrit Scholars and Scholars from other Disciplines

There is lack of co-ordination between Sanskrit scholars and scholars from other discipline resulting into half-hearted researches. We should encourage scholars from other departments to understand the language and discipline thoroughly respectively in order to be useful and meaningful. To quote Shri S.S. Gupta:

"I strongly feel that the path of real peace, progress and happiness of all the people can be found in Sanskrit works alone. I may be excused to all that the Sanskrit scholars do not know how to use modern tools of research and their knowledge of modern subjects is not what it ought to be. They normally do not communicate in the language which a literate person of today understands. So, they have failed to show the path of peace and happiness and quench the thirst of today's man. I think this explains why the Sanskrit scholars have kept themselves mainly busy with the researches on the literary aspects of these great works. I am equally convinced that the modern scholars of the various disciplines do not know Sanskrit and unfortunately because of their ignorance have yet to develop a love for this great subject which is certainly a store-house of knowledge, wisdom, logic, science, art, every things rolled in one and that too in capsule forms. I wish that a new phase should start which can make India a world leader in matters of permanent peace, happiness and brotherhood.[30]

4. Very Little Funds

More funds should be allocated for Sanskrit research which are in the priority area.

5. Superficial Claims

We are proclaiming rightly that Sanskrit literature is full of all types of knowledge generated by science and technology. This is true but we are not making efforts to go into minute details rather than be superficial. We should come out with definite theory, principles and practice.

6. Institutes not Functioning

Many people have set-up institutes in the name of Sanskrit just to befool the government and get grants to visit abroad. Such institutes should be audited and banned as these bring bad names to the country. The greatness of a Sanskrit Institution should be measured on the basis of the impact they make on the minds of the people. The aim of research should be to help people who have not read Sanskrit and thus motivate them to take interest in Sanskrit Literature and Philosophy.

7. The Funds at the Disposal of Sanskrit Institutes are Very Less as Compared to the Volume of Work

There cannot be indepth research. As stated by Prof. Rammurti Sharma, Vice Chancellor, Sampurnananda University, Varanasi, 90-95% of the texts available have not been made available in manuscript form for study this need be expedited and explored.

8. Universities not Pursuing Fruitful Researches

Need of developing Inter-disciplinary cells Universities can contribute a lot because there is a faculty of inter-disciplinary research. Professors of Sanskrit, Physics, Chemistry, etc. can make joint research projects to highlight our ancient hidden knowledge, chairs set-up in universities for sanskrit may be renamed as Research Centres by reframing their terms of references.

9. Researches are not Relevant to Solve Existing and Emerging Problems

Today, the researches are done to get degrees or publish the materials in new forms the existing material. The need is to help the people through Ancient Sanskrit Literature to improve their life and finds solutions to problems.

10. Sanskrit Language, Restricted to the Interest of Very Few People

Dr. M. Lakshmi Kumari in her article, "Sanskrit Research and Modern Challenges" rightly suggests.

As a Language: Sanskrit being the most ancient language, used, codified and perfected by man, has, through lack of use ceased to be a popular spoken language. Revival of Sanskrit should aim at expanding its base and popularity among all sections of the people and supporting all such efforts. Hidden from its folds would then emerge, glimpses of the wonderful refinement and culture that characterized the users of the language.

Concurrent with this problem is getting Sanskrit back into the national stream of education. If the so-called 'secular' government is reluctant to do it, parallel efforts—through short-term courses, examination and so on—should be made to enhance the popularity of Sanskrit.

Thirdly, incorporating the modern scientific concepts into Sanskrit, the language should be further enriched. Sanskrit with its extraordinary flexible base can effortlessly take up this challenge under the care of modern scientists and traditional scholars.[31]

Dr. M. Srimannarayana Murti in his article, "Sanskrit and Culture" also suggests the same.

The Sanskritists should dedicate to the task for they have to dispel doubts and remove confusion in the science-oriented minds of the modern youth regarding various facts of the hoary past of our country.

Interpolations from various texts in religious discourses and quasi-scientific interpretations to equate the modern science with the past do not fail to perplex the modern youth. Best reading materials and audio-visual tapes with abundant clarity in different regional vernaculars are to be made available. The translation norms are to be so precise and exact that the author's original ideas are exactly represented without any distortions or interpolations. Any enthusiast may read and interpret from any perspective as a sociologist, scientist, religionist, philosopher or a connoisseur. The redeeming feature about Sanskrit is that it still is regard with respect by vast millions who find their own culture, aspiration and ideals embodied in it. Sanskrit permeates all our lives, from birth to death. And it has been rightly prophesied by the oriental and occidental scholars that Sanskrit can't die out like a bent grass (Durva) which can hold its own against roughest of weather and most cruel trampling. Gurudeva Tagore's vision also is reflected in his songs that the first dawn of wisdom and knowledge made its appearance on the eastern horizon of the land of Bharata, in her great hermitage academies or the asramas of Rsis and that has been known to the world through the Sanskrit language.

P. Sriramamurti in his article "New Horizons of Sanskrit Research" has stated:

Sanskrit is a rich repository of religious, philosophical, scientific and literary texts. The authors used sense perception, logic and intuition and codified their knowledge making it purposeful and useful to mankind. All branches of knowledge were related to Purusarthas for their Abhyudaya and Nihsreyasa. This has to be inducted in all our intellectual pursuits to save humanity. A few prospective themes of Sanskrit research are suggested here. Studies in transpersonal psychologies and state specific sciences have got to be related to studies of Yogasutras, Yoga Upanisads, Yogavasistha and later Vedantic texts. Science of comparative religion and mythology should be benefitted by the way of interpretation of the Upanisads in the Vedanta sutras finding Ekavakyata in all religious texts of sages, saints and prophets. The micro and macro studies of languages have got to be guided by the study of Panini, Patanjali and Bhartrhari. The translation technologies with reference to Indian languages should take clues from the analysis of Sastraic and Kavya texts in Sanskrit. Literary criticism of all the literatures should draw upon the principles enunciated by Bharata and Anandavrdhana where they see Vakyaikya, Vastvaikya and Rasaikya in them.[32]

Growing up with the time and preparing to step into the 21st century, proving the Sanskrit is neither a dead language nor outdated, scholars are now geared up to prove its relevance in modern times. If this immortal language has stood the test of time in the past it will do so in future. To catch up with the changing trend all over the world, research activities have now started in scientific literature in Sanskrit, interdisciplinary studies in Sanskrit, etc. The fields normally covered are Agamas and Tantras, Art, Architecture, Archaeology, Buddhist, Jaina and Hindu studies, Dharma Sastra and Artha Sastra, Epics and Puranas, Manuscripts and Historical Sources, modern Sanskrit literature, Music and performing Arts, Philosophy, Poetics and Aesthetics, the related studies like Sanskrit and Regional languages, Sanskrit scientific literature, Sanskrit medical literature, Sanskrit and Environment, Sanskrit and Computers, Vedas and Vedangas, Vyakarana and Linguistics, etc. From this it is evident that the scope for research activities is enormous, no doubt, but how is it useful for mankind. What should be done to curb the declining trend of moral values?[33]

With a view to bring about the vast number of hidden messages as well as the positive attitude of man towards life, his appreciation of and harmony with nature, religious tolerance, respect for one another and such great qualities which are lacking in the present day, critical studies of a number of works have already been done, so also comparative study of different authors, works or concepts. Now is time to take up research projects appreciating the underlining messages of these works, estimating the high caliber of these writers, their outlook towards life and the relevance of their messages to posterity in modern times and also in future.[34]

It was the vision of Pujya Gurudev Swami Chinmayananda that "the eastern and western scholars should come together to one platform so as to vitalize the modern education with the rejuvenating ideas of our ancient philosophy the fruits of which should percolate down to the benefit of the common man." In his last address at Adi Sankara Nilayam, he said, "We have numerous disciplines of science in Sanskrit which the world is yet to know. Apart from the philosophy of our spiritual heritage which I have succeeded to some extent to bring out through the Yagnasalas over the last forty years, we have other branches to be investigated. We have not yet explored the possibilities of doing research on the various Sastras in Sanskrit language such as architecture, medicine, alchemy, astronomy, astrology, various systems of yoga and so on. By churning the knowledge contained in such ancient texts, the secrets can be brought out to save and serve humanity from the present ditch of pollution into which it has fallen both externally and internally.[35]

The main aim of the research projects to be taken up should be to bridge the wide gap between the scholars and the common man, between Ideals and Reality, between past and present, and to evolve a method of modify the good old systems to suit the modern times so as to face effectively the modern challenges.

Ever since the dawn of civilization, man has been constantly engaged in the pursuit of unraveling the mystery of nature with a view to arriving at the fundamental values of life. Today, the world is in a state of turmoil, the causes of which seem to be beyond man's comprehension and capabilities. Paradoxically enough, man seems to be lost in the world of plentitude. His soul is starved in the midst of unbounded materialistic pleasures and comforts that science and technology of today have placed at his disposal. Now man everywhere is bedeviled by complex and complicated moral, cultural and social issues. The harder he strives to extricate himself out of the web of these problems, the more he is caught and involved on it. Underneath the morass of conflicting values lies man's quest for the real meaning of life and the destiny to which it leads.

With all the scientific and technological revolutions that humanity has achieved so far, we have not risen above the level of satisfying the bare physical needs of man. Science does not help us to discuss the fundamental moral and spiritual values of life or 'how to live' and here we see that the advancement of science has led to mankind's lopsided growth and development.

India in ancient times was at the height of its glory in all the branches of knowledge. Scholars from all over the world used to come to get education in India. But today, paradoxically, Indians are building modern India on the ideology of Western knowledge and philosophy. This has created conflicts, tensions and degeneration in life. The Indians, by adopting the materialistic concept of life, are far away from spiritual Reality and consequently this has created a crisis of character. The concept of liberty and freedom popular in foreign countries satisfies only man's physical wants and aspirations but the concept of moksa, propounded by our ancient scriptures leads to complete happiness, the *summum bonum* of life. The noble adventure of planned development on which the country has launched since independence has highlighted the demand for scientific and technological knowledge in the national context. But today, there is a dichotomy between the scientists and Sanskrit scholars. The Government of our country at the Central and State level would have to strive hard to encourage the scientists to study the ancient Sanskrit literature like the Nyaya-vaisesika system.

Dr. Murli Manohar Joshi, Union Minister for Human Resource Development and Science and Technology, delivered the Convocation Address at the 5th convocation of the Rashtriya Sanskrit Vidyapeetha, Tirupati where he said, "I cannot recall any other society, which has throughout its history accorded such primacy to the quest for knowledge, untrammeled and unbounded by theocracy. The Western notion of a conflict between religion and science never existed in the Indian mind, because our culture, our way of life, our religion was always a scientific quest, a journey into the unknown."

Philosophy implies a natural and basic urge in human beings to investigate the nature of the concept of reality pertaining to Nature, Soul, and God, Bertrand Russel in his easy on 'Philosophy's Ulterior Motives' states: "To the completely unintellectual, general doctrines are unimportant; to the man of science, they are hypotheses to be tested by experiment; while to the philosopher they are mental habits which must be justified somehow if he is to find life endurable.[36] Thus, philosophy implies the enquiry into the phenomenon of life and its various permutations and combinations. It is rather impossible for man to live intelligently without a sound knowledge of philosophy. An eminent English writer, while emphasizing the importance of philosophy, stated: "Men live in accordance with their philosophy of life, their conception of the world. This is true even of the most thoughtless. It is impossible to live without a metaphysic. The choice that is given us is not between some kind of metaphysic and no metaphysic; it is always between a good metaphysic and a bad metaphsyci."[37]

Philosophy in the widest etymological sense means love of knowledge. Western philosophy has remained more or less true to the etymological meaning of philosophy, in being essentially in intellectual quest for abstract truth. Western philosophy is guided by theoretical interest. In the West, it is generally understood by philosophy, in so far as the latter is only a rational demonstration of what a man should do to truly better himself. Independent reflection untrammeled by authority is the foundation of Western philosophy. This view has been expressed by Plato in his dialogue with his discipline Glaucan in the following words:

"You see, then, Glaucan, that this study is really indispensable for our purpose, since it forces the mind to arrive at pure truth by the exercise of the pure thought."[38]

Indian philosophy, on the other hand, does not go wholly with the etymological meaning of philosophy. It goes beyond it—it is not merely speculative but it has both theoretical and practical aspects. Indian philosophy is a light with which we should illuminate all the dark corners of our being and realize in this life the ideals that are set-up before us by our thought and wisdom.

The philosophy in India began with a quest after the truth—truth not as mere objective certitude but as one which was closely linked up with the development of our personality for the attainment of the highest freedom, bliss and wisdom. To achieve this end, Indian philosophy aims at the direct realization of the Atman, which alone will bring absolute cessation of miseries and establish perfect peace and manifest bliss. Sruti says: "Atman should be visualized. It is the Atman of which we should have from the Srutis, it is the Atman of which we should reason, and upon which we should mediate: "O Maitreyi ! it is though the direct realization of the Atman, achieved through sravana, manana and nididhasana that everything is known."[39]

The idea of realization of Atman is borne out by the use of the world 'darsana' for a system of philosophy in India. 'Darsana' means vision. This may be either physical or intuitive. But in the present context, it should be understood in the latter sense. It stands for the direct, immediate and intuitive vision of the Reality as a whole. Thus, it is clear from the above that the use of the world 'philosophy' for 'darsana' is quite misleading unless we bear in mind the fundamental difference between the concept of 'darsana' and that of 'philosophy'. For want of a more appropriate word, we are constrained to retain the term 'philosophy', but we must not lose sight of the distinction mentioned above.

A serious problem facing Indian philosophy today is whether it is to be reduced to a cult, restricted in scope and with no application to the present facts or whether it is to be made a alive and real, so as to become one of the greatest formative elements inhuman progress, by relating the immensely increased knowledge of modern science to the ancient ideals of India's philosophers. All signs indicate that the future is bound up with the latter alternatives.

Recently, there has been a growing consciousness in the Government of India in this direction: it has set-up many Research Institutes of Ancient Scientific Studies to go into the past philosophies of India in order to collect the knowledge that may be useful today. There is a great wealth and variety of material in our literature and a great effort is needed to bring this ancient knowledge to the notice of scientists of the present day.

Let me quote one such eminent Western historian, the late Will Durant of America, who passed away at the ripe age of 96 after giving to the world a fascinating ten volume story of civilization, with its first volume, entitled, "Our Oriental Heritage", containing a large section of India, besides other books on philosophy and other subjects and one book on the Indian Political struggle for freedom with the title, "The Case for India", This last book was banned by the then British government in the 1930's . Here is a passage from that book: (pp. 3-4)

"Let us remember, first, that India is not a little island, nor a continent sparsely inhabited by savages, by a vast territory containing 32,000,000, souls, three times as many as in the United States, more than in North and South America combined, more than in the all Europe, west of Russian, combined; all in all, one-fifth of the worlds population. Let us remember, further, that in the northern and more importantly half of India, the people are predominantly of the same race as the Greeks, the Romans, and ourselves—i.e. "Indo-European" or "Aryans", that though their skin has been browned by the tireless sun, their features, resemble ours, and are in general more regular and refined than those of the average European; that India was the motherland of our race, and Sanskrit the mother of Europe's languages; that she was the mother of our philosophy; mother, through the Arabs of much of our mathematics; mother, through Buddha, of the ideals embodied in Christianity, mother, through the village community, of self-government and democracy. Mother India is in many ways, the mother of us all."

It goes without saying that the Nyaya Vaisesika system occupies a very prominent place in the Indian philosophical tradition. This system as a matter of fact is *sine qua non* for appreciating the intricacies of any philosophical system. Detailed discussions on epistemology as well as the various categories render this system indispensable for any scholar who wants to acquaint himself with the great tradition of the materialistic and spiritualistic systems of Indian thought. The recent interest evinced by the scholars all over the world in Indian logic as well as atomic theory of this system has also added to the width and depth of knowledge enshrined in this system.

OBJECTIVES

(a) To study the original Sanskrit Literature to find that the cultural heritage of India is essentially a scientific heritage. Let us explain with the example of Atomic theory.

The modern physical scientists take credit of having discovered the facts of this physical world which, they believe were not known earlier. They have found the real source of energy in electrons, protons, etc. However, they have not been able to determine the number of electrons, etc., in a particle of energy as yet. Therefore, the electrons, etc. cannot be accepted as additional basic elements. The physical scientists admit that the atom is the smallest particle of matter that can only take part in a chemical reaction. These are only the parts of the elements and the properties exhibited by them are the properties of the elements. The Joint System points out that the atoms have unlimited energy in them. The physical sciences could discover only a little. They can know only that part of the energy in the element which has become prominent due to the will of God. Thus, in the ultimate analysis, it is concept of element and not that of electrons, protons, etc., which is the basis of the physical sciences as electrons, etc., cannot have independent existence. Hence, the discoveries made by the physical sciences are neither an advance upon the Joint System nor are they fundamentally differ rent from it. However, it still needs a great effort to unearth the treasure of knowledge hidden in our ancient Indian philosophical systems.

(b) To study Sanskrit Literature to locate sources of aesthetic and emotional perceptions

Sanskrit is the embodiment of Indian culture and its importance can not be over-emphasized. Sanskrit, as Pandit Jawaharlal Nehru describes, is the 'greatest treasure and the finest heritage' of India. Dr. Sarvepalli Radhakrishnan, in his report of the University Education Commission observed: "Sanskrit as a language is an instrument of the greatest value in the delineration of all thought processes and the most profound rationalization of all ideas which are deep and subtle, of all the forms of aesthetic and emotional perception, and above all, of the most profound and ultimate forms of spiritual intuition and understanding. The study of Sanskrit enables us to draw freely upon our tradition which can lead to the new world outlook of modern man. It helps to keep pace with the rapid social change, advances in modern science and technology and process of modernization, at the same time inculcating the right type of social, moral and spiritual values through self-discipline." Educationist and thinkers have reasons to believe that Sanskrit, given its place of honour, will play a vital role in promoting national integration and in disseminating culture.

(c) To study Sanskrit Literature to Focus on Required, Knowledge and not mere Seattered Facts

Knowledge is power. If knowledge is mere accumulation of information, however well-organized, it can not free us. Assimilation should take place. Of what use is it if we have a lot of facts and figures on our finger tips, but lack common sense? Common sense, Swami Vivekananda observed, is not so common! Quality, and not quantity, is obviously more important. A grand intellect, stuffed with material, can be very mechanical in approach. Intelligence, on the other hand, is insightful by nature. Intellect goes in circles, whereas intelligence penetrates. Inellect operates within walls while intelligence cuts through walls. Intellect gathers and organizes according to known patterns; intelligence sees and ventures into the unknown! The old can not hold intelligence which is ever fresh, open and therefore full of life. Intellect is myriad patterns of thought, intelligence is the radiant beam from pure awareness, the Self. If we do not awaken the intelligence in us, our intellectualism soon loses its vigor. We then make more sound than bring light.

(d) To study Sanskrit Literature for National Integration and Quality of Home Life

A nation like ours with its plethora of languages, revival of Sanskrit should lead to creating harmonizing trends. As our sanskriti is highly unified, this could be achieved if the right appeal is made to the various language groups. Vinoba Bhave had dreams of this by making Devanagari as the common script. Such efforts would be in the right direction to create waves of national integration.

(e) To study Sanskrit Literature and Understand Indian Culture

Culture is a mode of life of a given nation or of a group or of an individual formed by blending values and norms. Values relate to the desirable social goals accepted by the interacting groups. Norms are the means to achieve social values. The very purpose of Sanskrit study is to know precisely the cultural history of our country as closely as possible and to connect whatever good in the past with present. Certain terms need to be redefined here in the Indian context. For example, the word 'secularism' in its basic sense refers to 'pertaining to things not spiritual or sacred'. Hence a secularist in West is 'one who theoretically rejects every form of religious faith and every kind of religious worship'. It also gained a connotation 'one who believes that education and other matters should be conducted without the introduction of religious elements'. This secularistic philosophy as adapted in various nations proved to be a total failure to bring happiness to man. Further it proved without any doubt that a society cannot exist without some values and norms for purposeful co-existence. From the Indian cultural context it has to be redefined reinforcing our values in true spirit of Indianism. Indian "secularist" should mean 'one who theoretically recognizes the existence of an eternal thing and allows full freedom to define the eternal and to practise diverse religious worships at his free choice'. This 'Indian secularist' advocates that "education and other matters should be conducted against the background of Indian national ethos without however imposing any particular mode of religious worship."

(f) To study Sanskrit Literature for scientific and technological development especially Nyaya-vaisesika

One of the working hypotheses in the field of Computers is that knowledge is representational, that is, 'knowing' consists in large part symbolic representation of facts about the world. Advanced systems use advanced mathematical concepts such as 'fussy' set concept. Again, in the field of artificial inelegance, prolog is a practical and efficient implementation of many aspects of 'intelligent' programme execution. Prolog means programming in logic and in this method of programming a computer, a uniform data structure called the 'term' is provided. It is out of this that all the data and prolog programmes are constructed. A prolog programme consists of a set of clauses, where each clause is either a fact about the given information or a rule about how the solution may relate to or inferred from the given facts. Thus, prolog can be seen as the first step towards the ultimate goal of programming in logic.

The science of logic, Nyaya, was rightly acclaimed by scholars of ancient India as 'pradipah sarya sastranam' the light of all branches of learning. During the last 2000 years philosophers belonging to various schools of Nyaya developed techniques of reasoning in various directions and finally emerged a well organized system of logic called Navya Nyaya. This scientific knowledge expanded the discipline of logic, rose to higher stages of development and it systematized forms of thinking by the application of mathematic methods and a special range of symbols. This formal logic, known as symbolic logic is the very foundation of modern computers.

The set Theory is the foundation of modern mathematics. Sets are defined by means of properties possessed by their elements with the help of prepositional functions. A bunch of grapes, a flock of sheep are examples of sets.

In Navya Nyaya the central idea of Avacchedaka Dharma is the same as that of the concept of a set in modern mathematics. For example, consider a set of all even numbers. The property possessed by every element of this set is that it is an even number.

The Nyaya or the modern school of Indian Logic lays almost exclusive emphasis on logical aspects of Nyaya and develops the theory of knowledge into formal logic of relations between concepts, terms and propositions. Indian logicians had the concepts of conjunction, disjunction and their negations. They knew what is now known as De-morgan's laws in symbolic logic. Of course, they never got around to using symbols. However, by 17th century Indian logicians came out with simplified mode of presentation and works like tarkasamgraha, bhasapariccheda, etc. made their appearance it is well known that researchers in the field of computer science have claimed that for programming the computers no language serves so well as Sanskrit.

The universal approach of Sanskrit enables it to meet the requirements of insatiable computer. Clever and ingenious manipulation of symbols is required in programming and the genius of Sanskrit is tailor-made for this purpose. It is not parochial patriotism but scientific veracity that acclaims Sanskrit as the most suitable language for the most advanced scientific veracity that acclaims Sanskrit as the most suitable language for the most advanced scientific tool of this century—the computer.

HYPOTHESIS

(a) Sanskrit Literature especially Nyaya Vaisesika is the basis of modern knowledge.

(b) Sanskrit Literature especially Nyaya Vaisesika do not limit themselves merely to physical world also deal to the complete fulfilment of life—Moksa.

(c) Sanskrit Literature is full of value Education which can pave the ways to maintain peace in the world as proclaimed in the preamble of United Nations.

(d) Sanskrit Literature contains useful information about medicine, logic, mathematics which can open new vistas of development.

(e) Sanskrit Literature can combine harmoniously physical, mental, social and spiritual progress of individuals and families and the world.

RESEARCH DESIGN AND METHODOLOGY AND TOOLS TO COLLECT DATA

In order to study the above research design, the following methodology and tools would be used:

1. Study of original Sanskrit literature (rare books) available at Pune (Advanced Centre of Sanskrit at Pune University).

Bhandarkar Oriental Research Institute, Pune, Oriental Research Institute, Mysore, Chinmaya International Foundation, Ernakulam, Vishvesharanand Vedic Institute, Hoshiarpur, Ramakrishna Mission, Belur Math, Kolkata, etc.

2. Study of original Sanskrit Literature and the works of Scholars in Universities like Kurukshetra, Delhi, Bangalore and Banaras, etc.
3. Study of literature at Indira Gandhi Centre for Art and Culture.
4. To have discussions with scholars in Sanskrit at various places like Udpi, Dharmsthala (Karantaka), Kurukshetra (Haryana), Varanasi (UP), Patna (Bihar), etc.
5. To do participatory observation in various reputed Ashrams like Haridwar, Rishikesh, Ahmedabad, etc.
6. To discuss with devotees from India and abroad about their level of understanding the Sanskrit Literature.

Significance and Relevance

Growing up with the time and entering into the 21st Century, proving that Sanskrit is neither a dead language nor outdated, scholars are now geared upto prove its relevance in modern times. If this immortal language has stood the test of time in the past it will do so in future as well. To catch up with the changing trend all over the world, research activities have now started in scientific literature in Sanskrit, interdisciplinary studies in Sanskrit, etc. The fields normally covered are Agamas and Tantras, Art, Architecture, Archaeology, Buddhist, Jaina and Hindu studies, Dharmasastrs and Arthasastra, Epics and Puranas, Manuscripts and Historical Sources, modern Sanskrit literature, Music and Performing Arts, Philosophy, Poetics and Aesthetics, the related studies like Sanskrit and Regional languages, Sanskrit scientific literature, Sanskrit medial literature, Sanskrit and Environment, Sanskrit and Computer, Vedas and Vedanagas, Vyakarana and Linguistics, etc. To quote Professor Murli Manohar Joshi, "The world is today heading towards a crisis situation largely because the principles of management that we are pursuing on the basis of the Western thought process are not conducive to the promotion of human welfare. Growth of consumerism and excessive exploitation of the natural resources of the world for immediate benefits of the mankind are responsible for the emergence of unsustainable development profiles in the world as a whole. The philosophy of life preached in our Veda, Upanisads, and Bhagavad Gita gives emphasis on various profound values of life such as the approach of restraint on self consumptions, treatment of World Community as a Family, balanced use of the world's resources, dedicating oneself to the cause of human welfare.[40] From this is evident that the scope for research activities is enormous. Let us mention specifically the revelance of research:

1. Knowledge of Physical world and moksa.
2. Methods to protect environment from pollution.
3. Maintenance of Physical, mental, social and spiritual harmony.
4. Knowledge of modern science.
5. Knowledge of Positive health through herbs, i.e. flora and Fauna.
6. National Integration and World Peace.

Human life is not calm like the deep sea nor does it run smooth like a river restricted by a dam. When the heart is turbulent with the storms of emotions, one has to learn to keep his head clear and out of reach and steer himself successfully away from the storm. This is possible only for those who develop a strong personality with a chosen ideal and live fearlessly with courage of conviction. Like a gem found unearthed, cut and polished to shine beautifully, each individual has to be inspired and trained to live with an ideal in dignity.

'Science without conscience is but ruin of the soul'—says Francis Rabelais. And conscience is nothing but the inner voice, the guiding factor, the voice of the Supreme Law Maker. Religion helps in achieving an inner change or rehabilitation or transformation so that the mind and intellect of the individual can be disciplined.

Swami Vivekananda beautifully sums up the great science of human potentialities. To quote: "Each soul is potentially divine. The goal (of life) is to manifest this divine within by controlling nature, external (by science, technology and socio-political processes), and internal (by ethics and the science of religion). Do this either by work, or workship, or psychic, control, or philosophy—by one or more, or all of the these and—be Free

"this is the whole of religion. Doctrines, or dogmas, or rituals, or books, or temples, or forms, are but secondary details."

"Let every man, woman and child, without respect of caste or birth, weakness or strength hear and learn that, behind the strong and the weak, behind the high and the low, behind every one, there is the Infinite Soul, assuring the infinite possibility and the infinite capacity of all to become great and good. Let us proclaim to every soul; Uttisthata, jagrata, prapya varan nibodhata—"Arise, Awake and stop not till the goal is reached." Arise, awake ! Awake from this hyponotism of weakness. None is really weak."

"Teach yourselves, teach every one, his real nature. Call upon the sleeping soul and see how it awakes. Power will come, glory will come, goodness will come, purity will come, and everything that excellent will come, when this sleeping soul is roused to self-conscious activity."

Contribution to Knowledge

It would add to both basic and applied knowledge. Basic knowledge would be attained by defining the various concepts, exploring new hypothesis and generating new issues. In the applied part, knowledge would be useful to make life happier and happier in the real sense of the term. The major contribution of Nyaya-vaisesika system lies in expounding a new perspective and complexion of the physical universe and ultimate Reality. This system is both ancient and modern, as it comprises the principles of ancient philosophy and modern science. The method of enquiry propounded by the system is analytical and critical which is the same as physical and social scientists have adopted. Like other philosophical systems, it has been promoting good life leading to real freedom—moksa. The fantastic achievement of modern science and technology in the past few years cannot conceal the fact that man suffers from deep contradictions and dichotomies—gaps between knowledge and wisdom; and between thought and action. The only answer to the present crisis fermenting in the world is the teaching research and practice of the tenets of the Indian philosophical system, especially the Nyaya-vaisesika system. Murli Manohar Joshi, an eminent scholar of science and at present Union Minister of HRD has stressed upon the need of study of Sanskrit by Scientists to usher an era of peace and prosperity in the country. To quote him: "I would say that Sanskrit universities should extend their learning centers in reputed scientific institutions like the Indian Institute of Science and other Institutions of Learning and Research, where facilities should be provided to the scientists to learn Sanskrit to open a window for the knowledge of higher science, mathematics, astronomy, architecture, philosophy and other branches of knowledge that are available in Sanskrit texts. The 'Gyan' and 'Vigyan' have to go together and it has always been like this in our counry."

CONCLUSION

We have discussed the role of ancient Sanskrit Literature in modern knowledge relating to Sciences, Social Sciences civilization and languages. We find that we are in possession of all knowledge in a better form than the other countries of the world but it need to be codified, put in order, assimilated and put to right use. Knowledge by itself is of no use unless put to action as ordained in Bhagavad Gita.

The philosophy in India began with a quest after the truth—truth not as mere objective certitude but as one which was closely linked up with the development of our personality for the attainment of the highest freedom, bliss and wisdom. To achieve this end, Indian philosophy aims at the direct realization of the Atman, which alone will bring absolute cessation of miseries and establish perfect peace and manifest bliss. Sruti says: Atman should be visualized. It is the Atman of which we should hear from the Srutis, it is the Atman of which we should reason, and upon which we should meditate: "O Maitreyi! It is through the direct realization of the Atman, achieved through sravana, manana and nididhasana that every thing is known.

Besides, we should not take pride merely in modern knowledge but rather promote our exclusive knowledge in ancient Sanskrit Literature, i.e. making of human beings through consciousness, spirituality so that they can achieve Moksa. Jawaharlal Nehru has rightly said that: "Nothing is more advantageous and more credible than to have a rich heritage, but nothing is more dangerous than to sit back and live on that heritage. A nation cannot prosper if it merely imitates its ancestors. What builds a nation is creative, inventive and vital activity."

Scientists must address themselves to the removal of poverty in 21st century but science alone cannot be successful in this venture until and unless it falls back upon ancient values and ethics as contained in ancient Sanskrit literature. Our stress should be not only on physical world but metaphysical as well which is our unique contribution to the world. We should practice it in India before exporting to other countries. The tragedy is that our great saints and philosophers take pride in setting their centers in foreign countries while our country need them desperately. Charity begins at home.

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CHAPTER 2

SCIENTIFIC AND SOCIAL SCIENCE RESEARCH AND INDIAN EPISTEMOLOGY

> The main function of a philosophical enquiry is to find an explanation of the universe. The explaining principle has to be ultimately real because it has to provide a basis for everything real. Therefore, Radhakrishnan thinks that the ultimate reality must be able to satisfy all questions regarding the how and why of the universe.
>
> In conceiving the nature of the ultimate reality Radhakrishnan leans heavily on the Vedanta. The Vedanta conceives the ultimate as the Brahman, which has not to be proved or established, it has got to be accepted because without presupposing it nothing can even be thought of. More or less in the same vein Radhakrishnan also says that the ultimate reality is the Brahman—the Absolute—which is the logical ground of everything real and existent.
>
> —*Radhakrishnan*

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CHAPTER

Scientific and Social Science Research and Indian Epistemology

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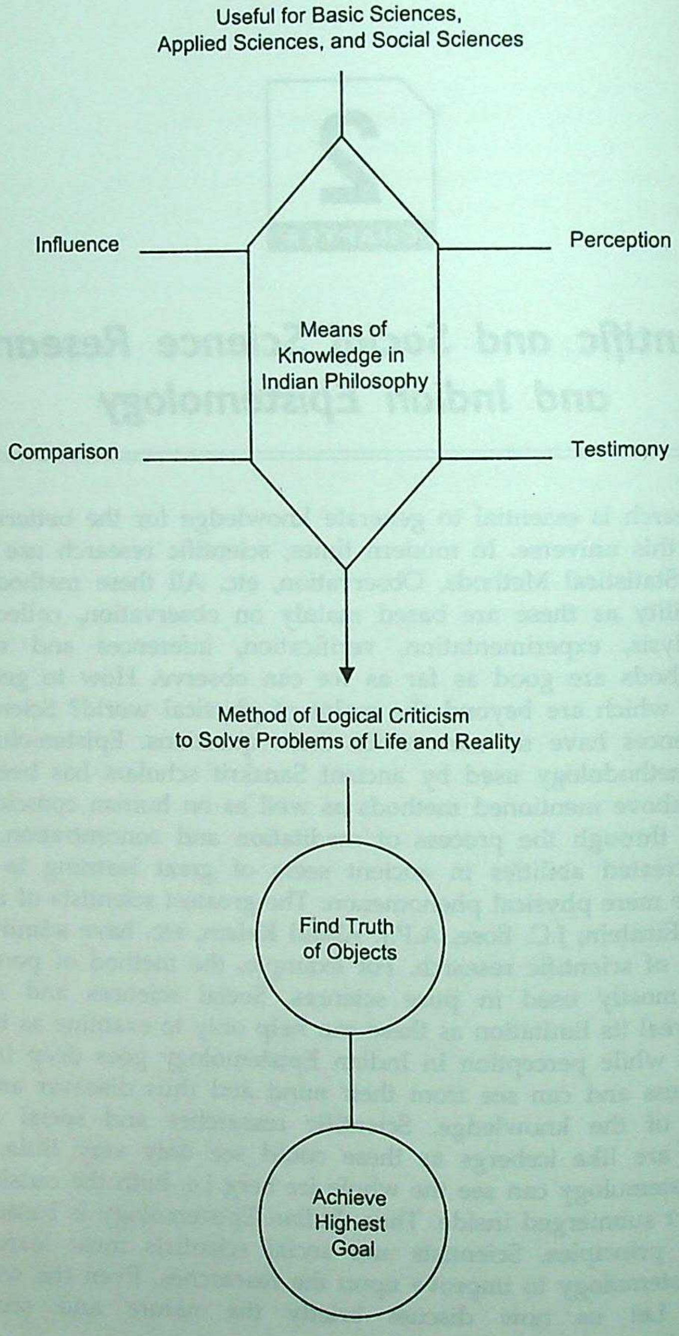
Research is essential to generate knowledge for the betterment of people in this universe. In modern times, scientific research use Survey Research, Statistical Methods, Observation, etc. All these methods have limited utility as these are based mainly on observation, collection of data, analysis, experimentation, verification, inferences and validity. These methods are good as far as we can observe. How to get about researches which are beyond the realm of physical world? Science and Social Sciences have no answer for these questions. Epistemology the research methodology used by ancient Sanskrit scholars has been built upon the above mentioned methods as well as on human consciousness developed through the process of meditation and concentration. These methods created abilities in ancient seers of great learning to gauge beyond the mere physical phenomenon. The greatest scientists of modern tunes e.g. Einstein, J.C. Bose, A.P.J. Abdul Kalam, etc. have admitted the limitations of scientific research. For example, the method of perception which is mostly used in pure sciences, Social sciences and applied success reveal its limitation as these can help only to examine as to what is feasible; while perception in Indian Epistemology goes deep into the consciousness and can see from their mind and thus discover and find the bases of the knowledge. Scientific researches and social science researches are like icebergs as these could see only very little, while Indian Epistemology can see the whole ice berg i.e. both the outside and a large part submerged inside. Thus, Indian Epistemology is based upon the sound principles. Scientists and social scientists must learn from Indian Epistemology to improve upon the researches. Even the scientists admit it. Let us now discuss briefly the nature and scope of Epistemology.

CHART 2.1


Useful for Basic Sciences,
Applied Sciences, and Social Sciences
Influence
Perception
Means of
Knowledge in
Indian Philosophy
Comparison
Testimony
Method of Logical Criticism
to Solve Problems of Life and Reality
Find Truth
of Objects
Achieve
Highest
Goal

Knowledge is power. A.P.J. Abdul Kalam has beautifully said that:

Knowledge has always been the prime mover of prosperity and power. The acquisition of knowledge has therefore been the thrust area throughout the world, and knowledge society can be the foundation of building a developed India.

THE KNOWLEDGE SOCIETY

Nations build themselves into knowledge societies by understanding the dynamics of knowledge and transforming it into wealth.

- The knowledge society uses knowledge through all its constituents and endeavours to empower and enrich its people.
- It uses knowledge as a powerful tool to drive societal transformation.
- It is a learning society committed to innovation.
- It has the capacity to generate, absorb, disseminate and protect knowledge and use it to create economic wealth and society good for all its constituents.

Arun Nehru observed that Mahatma Gandhi, without doubt the greatest figure of the 20th Century, demolished the imperial world of kings and queens with little more than a bomboo staff, an iron will and faith. Under his vision and leadership, Pandit Jawaharlal Nehru and his team built the "temples of modern India." Few in the developed world supported India as we emerged from centuries of bondage and it took great courage, determination and an iron will coupled with a great vision to stress upon the principle of self-reliance.

Five decades of continuous struggle have given us the capability to cope with our future objectives. The task before us is not easy as we have to balance economic growth with development and poverty alleviation, food security and infrastructure. But at the positive end, we should remember that "technology" today is moving forward to our assistance at a blistering pace and if the last 50 years have globally achieved more than the previous 500 years in development, then the advances in the next 20 years can and will be miraculous.[1]

However, our ancient philosophical system gave primary to knowledge. Dhirendra Mohan observes:

Epistemology or the theory of knowledge has acquired special importance in European philosophy in the modern period, particularly in the philosophies of Locke, Hume, and Kant who thought that without a prior critical examination of the elements, sources, and limits of knowledge we should not engage in metaphysical discussion. So he regarded all previous philosophy as dogmatic as contrasted with his own critical philosophy. In more recent times, however, the American neo-realists have tried to oppose the general modern European trend, initiated by Kant, that the theory of knowledge should precede the theory of reality. They have chosen to be consciously dogmatic. They are led to this position by a kind of reaction against the use of epistemology made by most modern idealists for establishing idealistic theories of reality.

But in India the position has been otherwise. From the very beginning of the different systems of philosophy until recent times, discussions on the problems of knowledge (including those of doubt and error) have formed an essential part of philosophy. The reason for this striking and continued unanimity can be found in the fact that all schools of Indian philosophy, without exception, regarded ignorance as the root cause of human suffering, so that they were all bent upon discovering the means and processes of true knowledge by means of which reality could be known and life could be so lived as to overcome misery or minimize suffering. Vatsyayana voices the feeling of all Indian thinkers on this matter when, in commenting upon the first sutra of Gautama, he says that the study of the sources of knowledge (pramana) is necessary, because through it alone can we properly know reality and thereby guide our actions so as to be able to attain desirable ends and avoid suffering.

Epistemology thus becomes closely linked up with ontology and both of them again with ethics closely. Knowledge and moral perfection are regarded as necessary to each other in almost all systems of Indian thought. Sometimes knowledge is regarded as the means to the good life, sometimes again moral purity is regarded as indispensable for perfect knowledge, so that morality and knowledge are regarded as the two inseparable aspects of perfection.

In the course of the development of the Indian systems interest in epistemology increased and it began to claim a large share in the philosophical discussions of almost every school. The motives were sometimes theoretical; sometimes practical, sometimes simply polemical. But all led to the enrichment of epistemological thought and literature.

M.S. Thacker, in his Presidential address to Indian Science Congress held at Madras in 1958 observed that Indian Science penetrating minds have held the view that the consequential value of the scientific way of thinking transcends the material benefits which science has conferred on mankind. It is to be propagation of this sustaining value of Science that scientists must address themselves. It is a big responsibility which can be discharged only when the scientists revise their "ivory tower" attitude and recognize that their responsibility to society is no less important than their loyalty to science and that there is so conflict between the two.

Science is not merely thematics, that is, the study of certain subjects. It is study by certain methods which emphasizes observation and experiment, reasoning and deduction—a method based on facts, their sequence and relative significance. The scientific method enjoins one to be critical of all things and accept only facts which are amendable to verification and test. It has a place as much in the education of the scientists and technologists as of the craftsman and citizen, whether he be employed in a skilled or unskilled job, in agriculture or administration.

Everyone longs in a vague sort of way for an understanding of science, and this has to be satisfied, not by providing bits of information, but by making him aware of the basis on which science rest, the method by which rational knowledge is gleaned. The real danger to education is to mistake the provision of information for the imparting of knowledge. It is easy to acquire strands of information from diverse sources, but that does not help in understanding science. The greatest common factor of all sciences is the method; and the mind that has been trained in the scientific method and habituated to form judgments on the basis of facts, their relative sequence and significance, converts all that passes through it into science. It is such a mind that is best equipped to meet the challenge of change in a dynamic and forward-looking society.

The educational task involved in promoting the understanding of science is a gigantic one, but all the attention that is devoted to is and all the effort expended on it will prove most rewarding. A primary requirement is to dispel the popular conception that science is some sort of a super-discipline practiced by specially trained people using very complicated precision instruments. This incorrect, if exalted, view of science has tended to separate the scientist as a class from the people. Science is a very human enterprise and is basically a methodological approach to understanding. The best way to obtain an insight into the method and to acquire the habit of dispassionate thinking is to take a live interest in some small area of natural phenomena. The material for science is co-extensive with the whole physical universe and there are many problems which are amendable to investigation by tools and techniques which are ordinarily available to the layman.

The duty of scientists in promoting the public understanding of Science assumes importance in the context of the newer Promethean creations of technology, which are being released in breathless succession. Francis Bacon stated that "God has placed no limits to the exercise of the intellect. He has given us on this side of the grave." Bacon envisaged the exercise of the intellect only for the emancipation of man. The newer developments, from the point of view of knowledge gained, have extended the glory of man, but they have inculcated, at the same time, a fear of knowledge which has potentialities for more harm than good. In this situation of uncertainty and doubt, safety lies in the collective social wisdom, for it alone can determine the direction of technological applications and can hinder or nullify injurious experimental ventures.

Nature of Pramana

Pramanas are the canous of knowledge by which we can verify the existing knowledge. The term 'pramana' is split-up as 'pramayah karanam' or 'pramiyate anena'. In the former, there are two terms: 'prama' and 'karana'. By 'prama', Vatsyayana means 'the apprehending of the object', which is called right knowledge.[1] Gangesa defines it as the right knowledge of a thing as it exists, or right knowledge of a thing in the manner it exists.[2] In other words, by 'prama', we mean correct and direct experience which does not depend upon anything else for its apprehension. The second term 'karana' has been defined by Paniji as 'sadhakatanam karanam',[3] that is a Karma is the most efficient cause to accomplish a certain end. Summing up the two terms, it comes to mean that a Pramana is that which leads necessarily to the accomplishment of a certain action. Pramata (the knower), pramana (means of knowledge), prameya (the knowable) and prama (the knowledge)—these four terms comprehend artha-tattva, the truth about the object.[4] But the most essential of these factors is pramana, without the presence of which right knowledge would not arise at all. Vatsyayana says. "It is that by the instrumentality of which things are rightly cognized."[5]

By 'primiyate anena', the second inerpretation of the term pramana, we mean that pramana is that means of knowledge by which the knower acquires the valid knowledge of an object, the cognition of the objectss (arthapratipattih).[6] "Sivaditya brings out the logical implication when he defines pramana as that which produces prama in accord with reality.[7] Hence, it is through the right knowledge that the verification of definition of the object is done and the object is correctly known.

Validity of Pramana

Nyaya-vaisesika system considers cognition (buddhi) as synonymous with knowledge (jnana), apprehension (uplabdhi) and comprehension (pratyaya), and give it the general meaning of reflexive consciousness of objects, exterior or interior.[8] This knowledge is not a substantive modification of prakrti as in Samkhya, neither is the awareness of vedanata, nor even the act of cognition, as in Mimamsa or Buddhism; it is conceived in Nyaya system as a quality of the soul. Nyaya, being realistic, believes that knowledge reveals both the subject and the object which are quite distinct from itself. Just as the light of a lamp reveals physical things, so also knowledge manifests all objects that come before it. This knowledge is neither valid nor invalid in itself; it is the bare manifestation of objects. Validity or invalidity of knowledge is known by its workability.[9] When we perceive an object as water, approach it, drink it and satisfy our thirst, we know that our knowledge is valid, but when we perceive an object as water, pursue it, but never get water, and cannot satisfy our thirst, we know that our knowledge is invalid. Thus, successful action establishes the validity of the knowledge.

The other systems of Indian philosophy have different views about this topic. According to Samkhya school, both the validity and invalidity of an experience are known intuitively. Thus Samkhya regards validity and invalidity of knowledge as intrinsic. But this view of Samkhya has been criticized. According to Nyaya system, the same knowledge cannot be both valid or invlaid. So the Samkhya doctrine of intrinsic validity and invalidity of knowledge is not tenable.

According to Buddhists, every knowledge is invalid prior to any successful activity. The Naiyayikas reject this view. If the invalidity of knowledge be self-evident, why should a man run after the false, knowing that it is false? Hence there cannot be any practical reaction in connection with illusion.

According to the Mimamsakas, every experience is valid. It may, however, be regarded as false when later on it turns out to be so, or when it is contradicted by another subsequent experience. This view is called the doctrine of svatah pramanya (self-validity of knowledge). But the Naiyayikas reject this view. According to Nyaya, knowledge is just the manifestation of objects. It is not ascertained as valid or invalid at its very inception. It arises from other circumstances than those which give rise to knowledge. Thus the Nyaya system holds that the validity or invalidity of knowledge are known by extraneous conditions.

Division of Pramana (See Chart 2.2)

There is much difference of opinion among Indian thinkers about the sources of valid knowledge. The Carvakas recognize only one pramana, viz., perception, and reject al other means of valid knowledge. According to them, the perceptible world is the only reality. The things perceived by five sense-organs only are real.[10]

The Buddhists hold that perception and inference are the two ultimate sources of true knowledge.[11]

According to Samkhya Yoga, like perception and inference sabda or verbal testimony also should be recognized as an independent source of knowledge. Upamana, arthapatti and sambhava are included by them under inference, and abhava under perception.[12]

According to the Vaisesikas,[13] there are four kinds of true knowledge, namely, perception, inference, memory and intuitive experience (arsjnana). They include sabda, upamana, arthapatti, abhava, sambhava and aitihya within inference.

According to the Jainas,[14] perception, inference, testimony, recognition and memory are all independent sources of knowledge

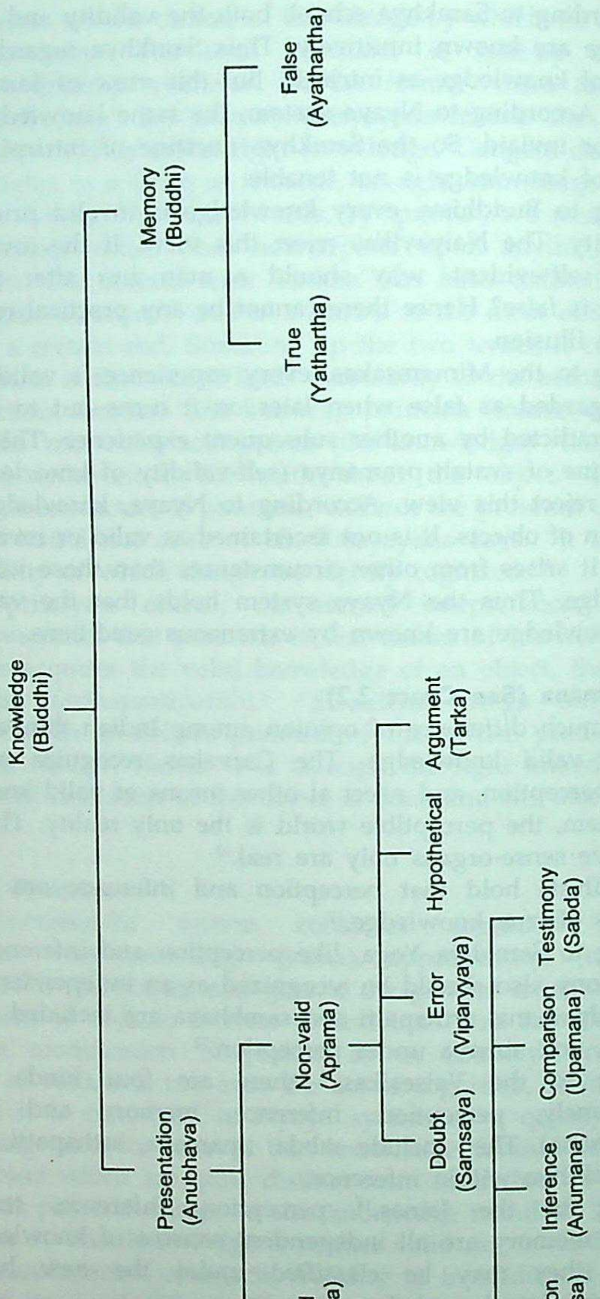
Although they may be classified under the new heads of immediate and mediate knowledge.

The Prabhakaras hold that arthapatti also should be accepted as a separate source of knowledge like perception, inference, testimony and comparison.

The Bhattas and the Vedantins add anupalabdhi to these five

CHART 2.2

Classification of Knowledge According to Nyaya System


Knowledge
(Buddhi)
Presentation
(Anubhava)
Memory
(Buddhi)
True
(Yathartha)
False
(Ayathartha)
Valid
(Prama)
Non-valid
(Aprama)
Perception
(Pratyaksa)
Inference
(Anumana)
Comparison
(Upamana)
Testimony
(Sabda)
Doubt
(Samsaya)
Error
(Viparyyaya)
Hypothetical
Argument
(Tarka)

source and maintain that there are six distinct source of knowledge.

The Puranikas go further than this in holding that sambhava and aitihya also are to be recognized as separate sources of knowledge like the six pramanas admitted by the Bhattas and the Vedantins.[15]

The Tantrikas recognize nine pramanas, namely, perception, inference, comparison, testimony, anuplabdhi, arthapatti, aitihya, sambhava and cesta.

But the Naiyyayika accept only four independent sources of knowledge, namely, (1) perception, (2) inference, (3) comparison and (4) testimony[16] they include all other source of knowledge propounded by other system under these four pramanas. We must be clear at the very outset that four pramanas sometimes operate conjointly and sometimes individually according to the nature of the pramana. The same object may be known by any of the pramanas at a time. This is called pramana-samplava. For example, the self is known from Vedic testimony. It is inferred from desire, aversion, pleasure, pain and knowledge. It is known by yogic perception due to a particular conjunction of the self with manas brought about by meditation. Thus, the self is known by testimony, infernece and perception. But sometimes an object is known by one pramana only. "The performance of Agnihotra oblation is a means to the attainment of heaven"—it cannot be known by perception and inference, but by Vedic testimony only. This is called pramana vyavastha.[17]

We discuss now that even science is realizing the validity of epistemology of Indian Philosophy.

VIEWS OF EMINENT SCIENTISTS

T.R. Seshadri in his address to the Indian Science Congress in 1967 at Hyderabad admits the role of ancient Indian Philosophy in arriving at truth by scientific method. Indian thought upholds both religion and Science as valid disciplines in the pursuit of truth. India's thinkers never found any contradiction between the two. The method of investigation in the field of religion is largely the same as in the positive sciences. A thorough scientific study of the facts of the inner life was undertaken by the great thinkers of ancient India; the insights which they gained were re-tested and amplified by a galaxy of subsequent thinkers. It is because of this that Indian spirituality has stood the test of time and is also fully hospitable to modern Science.

He then concludes that there is no conflict between Science and religion. Both have the identical aim of helping man to grow in spirituality, and of ushering in a better social order. Each by itself is insufficient and helpless. The combination today of the spiritual energies of these two complementary disciplines in the life of man will produce fully integrated human beings and thus help to evolve a complete human civilization. This synthesis is the most outstanding contribution of Swami

Vivekananda to human thought of the present time.

It has been the conclusion of many thinkers that great movements in India have always had a basis in spirituality and her part in the harmony of nations is to play the spiritual note. The recent examples of Gandhiji confirms that we have not lost the great tradition. His whole life was a grand effort to spiritualise politics. Will it not be far more easy to bring Science and spirituality together?

INTELLECTUAL AND CULTURAL VALUES OF SCIENCE

From very ancient days Science has continued to have high intellectual and cultural values. Though culture is popularly associated with certain shows, it is not easy to define, as numerous components are involved, the most important being the scientific and rational attitude of mind. Imagine what would have been the level of our ancient culture and civilization if the primary attitude of enquiry and critical assessment and search for truth at all levels, physical, mental and spiritual, was not there. In the modern context, this is forgotten and most of the cultural activities have very little of Science component in them. There is another aspect of Science and that is its importance for mental and intellectual health. All of us know how costly cricket is and all other sports including wrestling, boxing, hunting, mountaineering and travel. Sports are generally intended to foster bodily health and fitness though this is frequently forgotten and the business part and other considerations become dominant. Mind is far more important, powerful and valuable and should be kept in proper health and condition. For this purpose nothing can be better than Science, and many great people obviously took to Science for this primary attraction. Very early in the history of civilization Mathematics and Astronomy received attention. They continue to be attractive even now, though many other aspects of Science have developed similar values in recent years, for example, Particle Physics and Structural Chemistry and Molecular Biology.

The aim of Science and technology is not only to meet the materialistic needs of the country but also to create a better world with higher objective and with a conception of global community. The time has come for nations to act in this vision. This is not a difficult task if the nations are really keen to realise the truth that the "World is one, in fact and a potentia" and if they could have the perception of the unity amidst diversity, a harmony amidst chaos and if they are prepared to listen to the note of concord throughout the discordant sounds in this universe. Such perception comes from the microcosmic mind provided it is in perfect harmony with the macrocosm (external). Knowledge on this cosmology will help science and technology to achieve the higher objectives when peace will be showered on earth and the whole universe as a single entity will begin to shine in its own glory.

"Where knowledge is free;
where the world has not been broken up
into fragments by narrow domestic walls;
Where words come out from the depth of truth;
Where tireless striving stretches its
Arms towards perfection;
Where the clear stream of reason has not lost its way
Into the dreary desert sand of dead habit
Unto the Heaven of Freedom,
my father, let my country awake."

May we all join in this quest for such a Heaven of Truth and Freedom.

The importance of the Nyaya for the other schools of Indian philosophy lies not only in its rigorous of defence of a pluralistic realism but also in the bringing to the fore of questions related to epistemology —the means (and defence) of knowledge. With regard to the other Hindu schools it has been noted that:

> Though they rejected the metaphysical tenets, they accepted the general methodology of the Nyaya-Vaisesika school and soon, thanks to their efforts, instead of remaining a mere school of philosophy, it attained a position of pre-eminence in the science of methodology. Thus, in ancient India a pupil was first required to learn grammar and then Nyaya or logic. Unless a student took lessons in Nyaya he was not supposed to be competent to study Purva Mimamsa or Vedanta.

As B.K. Motilal remarked:

> Indian philosophical literature did not always deal exclusively with idealism, monism, subjectivism and mysticism. The Nyaya-Vaisesika writers were, instead, critical and positive thinkers, and genuinely interested in logic, analysis of human knowledge and language, and descriptive metaphysics.
>
> Motilal, 1977: 112

Now, we would analyze in depth the four means of knowledge accepted by Nyaya system.

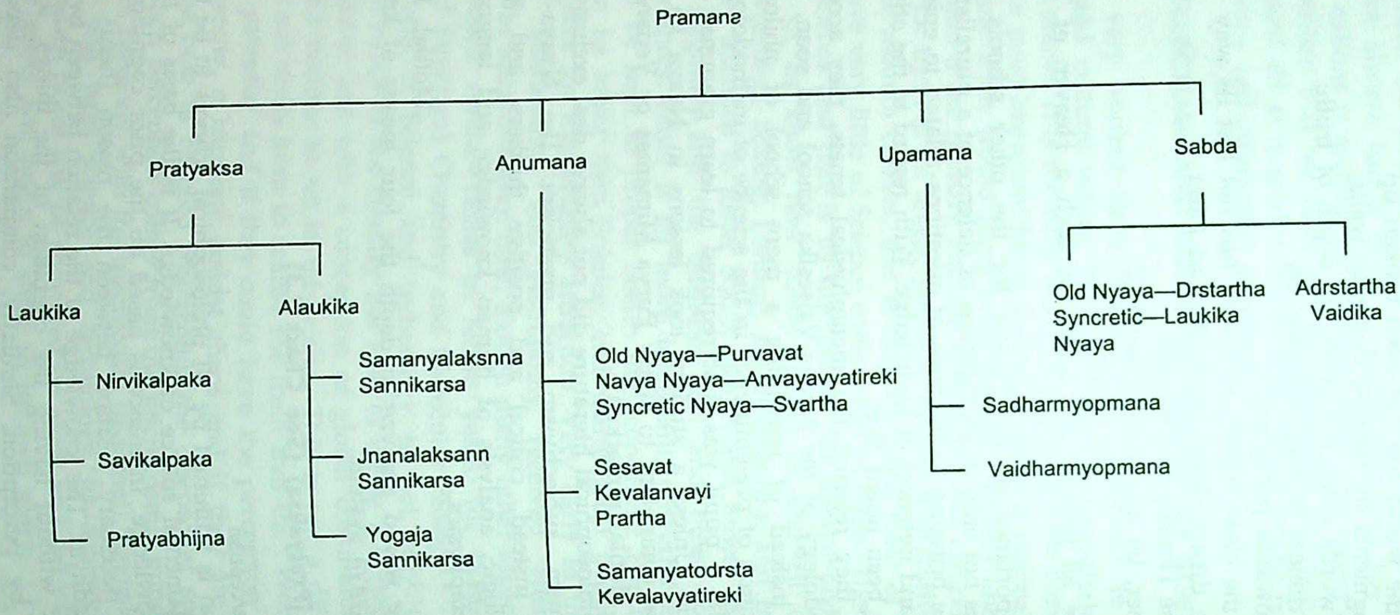
1. Perception (Pratyaksa) (See Chart 2.3)

Importance of Perception

Perception is admitted by all philosophical schools to be the most basic and fundamental source of knowledge. It is the basis of the other methods of knowledge. Inference is based on the prior cognition of the universal and necessary relation between the reason (hetu) and the consequence (sadhya). The knowledge of the relation between two things is not possible without having the cognition of the things. It can be obtained only by perception. Similarly, comparison also depends on perception of the points of similarity or dis-similarity between two

CHART 2.3

Detailed Exposition of Pramanas as Accepted by Nyaya System


Pramane
Pratyaksa
Anumana
Upamana
Sabda
Laukika
Alaukika
Nirvikalpaka
Savikalpaka
Pratyabhijna
Samanyalaksnna Sannikarsa
Jnanalaksann Sannikarsa
Yogaja Sannikarsa
Old Nyaya—Purvavat
Navya Nyaya—Anvayavyatireki
Syncretic Nyaya—Svartha
Sesavat
Kevalanvayi
Prartha
Samanyatodrsta
Kevalavyatireki
Sadharmyopmana
Vaidharmyopmana
Old Nyaya—Drstartha
Syncretic—Laukika
Nyaya
Adrstartha
Vaidika

objects. Testimony is also dependent on perception in as much as the first step in it is the visual perception of written or spoken words, and such words must come from a person who has a direct knowledge of the truths communicated by him. So we see that perceptual knowledge is the ultimate ground of all other knowledge by inference, comparison and testimony. J.S. Mill[18] recognized this truth when he said that "the truths known by intuition are the original premises from which all others are inferred." Secondly, perception is the final test of all knowledge. The knowledge from inference, comparison and testimony requires confirmation but the perceptual knowledge needs no confirmation.[19]

In Western philosophy, the validity of perception is unquestionable and self-evident. J.S. Mill remarks: "Whatever is known to us by intuition, is known beyond possibility of question.[20] Similarly, Russell tells us repeatedly that the truths of perception are self-evident truths, for which we require no test at all.[21] The Naiyayikas, however, do not admit that the truths of perception are self-evident and unquestionable. From the standpoint of common-sense realism they admit that, under normal conditions, what is directly perceived is not doubted and so need not be further proved or tested. When, however, any doubt arises with regard to the validity of exception, we must examine and verify it as much as any other knowledge.

Lawrence Babb notes a similar model at work amongst contemporary Hindus.

> In the Hindu world 'seeing' is clearly not conceived as a passive product of sensory data originating in the outer world, but rather seems to be imaged as an extrusive and acquisitive 'seeing flow' that emanates from the inner person, outward through the eyes, to engage directly with objects seen, and to bring something of those objects back to the seer. One comes into contact with and in a sense becomes what one sees.
>
> Babl, 1981: 396-7

According to the Nyaya Sutra:

> Perception is that knowledge which arises from the contact (samnikarsa) of a sense-organ with its object, and which is inexpressible (avyapadesya), unerring (avyabhicara) and of a determinate (vyavasayatmaka) nature.
>
> Nyaya Sutra: 1.1.4

Definition of Perception

Gautama defines perception as non-erroneous cognition produced by the intercourse of the sense-organs with the objects, not associated with a name, and determinate. There are four points in this definition which need consideration: (1) sense-object contact-which is the specific defining character of perception according to Gautama, (2) avyabhicari-which establishes the logical condition of a valid perception, (3) avyapadesyam, and (4) vyavasayatmakam. Both these terms represent the two types of perception.

Part I of this definition follows from the etymological meaning of the word 'pratyaksa' which means the functioning of the sense-organs, each in relation to its particular object.[22] Perception is a kind of cognition which is generated by the contact of the self with the mind, the contact of the mind with the sense-organs and the intercourse of the sense-organs with their proper objects. In Gautama's definition of perception, the contact of the soul with the mind and of the mind with the senses is not mentioned, because it is common to cognition produced by all the pramanas. The definition mentions only the specific cause of perceptual knowledge. The specific feature of this definition is the sense-object-contact, which is accepted by many philosophical systems. In the Vaisesika system, perception is described as knowledge which is conditioned by the senses. The same view is expressed in Samkhya system as "perception is the direct cognition of an object by a sense-organ when the two come in contact with each other." In the Yoga system it is held that perception is especially a cognition of the particularity of an object. For it, perception is 'a mental modification produced by sense-impressions and mainly related to the specific characters entering into the nature of the individual object of perception'. Perception is defined in Mimamsa system as 'the cognition which is produced by the efficient contact of the senses with their objects'. From all these definitions of perception given by different philosophical systems, we see that the sense-object-contact is the essential nature of perception.

But the sense-object-contact cannot be the touch-stone of perception, e.g., we can hardly speak to the perception of God which is not produced by the external senses. There are also such cases of knowledge which are perceptual in character and yet not brought about by sense-object-contact. When someone sees a snake in a rope, there is really no snake to come in contact with the eyes. Mental states like the feelings of pleasure and pain are directly cognized by us without the help of any sense-organ. Thus, we cannot justify the sense-object-contact as the special feature of perception.

Another definition of perception given by Gangesa and Visvanath is that "it is the knowledge which is not brought about by the instrumentality of any antecedent knowledge." This definition is applicable to human as divine perception. In the syncretic school of Nyaya, it has been attempted by scholars to reconcile the Gautama's definition of perception with the Gangesa's definition. Kesava Misra in his 'Tarka Bhasa' defines perception as the source of valid immediate knowledge; and immediate knowledge is that which is brought about by sense-object-contact. Hence for knowledge, there is no distinction between what is immediate and what is sensed. Rather immediate knowledge is just the product of sense-stimulation.

In the second part of the definition, the word 'avyabhicari', i.e., non-erroneous cognition, mentions the logical conditions of valid perception i.e., it should not contradict the real nature of the object. For instance, it is found that during the summer, the rays of the sun become mixed up with the heat-rays radiating from the surface of the earth and thus the two together appearing at same distance come in contact with the eyes of an observer who apparently seems to have direct perception of water arising out of the sense-organ and the object-contact. In order to avoid such cases of wrong notions, the word 'avyabhicari' has been added to the definition.[23]

The third and fourth parts of the definition mention two kinds of perception: (i) avyapdesyam, i.e., which is not associated with a name, and (ii) vyavasayatmakam, i.e., well-defined or determinate perception. The other ancient Naiyayikas call the first type of perception as indeterminate perception (nirvikalpaka) and the other as (savikalpaka).

From Gautama's definition, we may arrange the process of pratyaksa jnana like this—(a) due to sense-object-contact a simple cognition is produced in the Atman in the form of 'ayamghatah' (this is a jar) which is called, in the Naiyayika terminology, 'vyavasayatmakajnana', after the nirvikalpaka-jnana of the same; (b) then there is the recognition (anuvyavasaya) of the same knowledge which is expressed in the form of a judgement-I possess the knowledge of a ghatah; (c) then follows the remembrance of two possibilities—validity of the knowledge and invalidity of the knowledge—thus producing a doubt; and (d) after the perception of the distinguishing feature, the validity is cognized and expressed in the form—'this knowledge is valid, as it leads to effective activities, like any other knowledge'. This is the process of pratyakasajnana.

PERCEPTION IN SOCIAL SCIENCES

In social sciences, perception is known as observation which is limited to external sense.

Science begins with observation and must ultimately return to observation for its final validation. P.V. Young defines it as "a systematic and deliberate study through the eye of spontaneous occurrences at the time they occur."

Observation may serve the investigator in his research purposes in several ways:

(a) It enables the observer to gain insights of the actual phenomenon that can be later tested by other techniques.

(b) Observation may be used together with supplementary data that may help to interpret findings obtained by other techniques.

(c) It may be used as the primary method of data collection in studies designed to provide accurate descriptions of situations or to test casual hypothesis.

(d) The observation is used to perceive the nature and extent of significant interrelated elements within complex social phenomenon, cultural patterns or human conduct.

It provides a clear and authentic picture of a given situation and requires less dependence on securing people's cooperation as contrasted to the interviewing method. However, such observation can be superficial also. That is why perception in Indian Philosophy has deep connotation.

According to the Nyaya Sutra:

> Perception is that knowledged which arises from the contact (samnikarsa) of a sense-organ with its object, and which is inexpressible (avyapadesya) unerring (avyabhicara) and of a determinate (vyavasayadmaka) nature.
>
> —Nyaya Sutra: I.I.4

P.N. Srivastava, in his address to the Indian Science Congress in 1994, Jaipur is said that we are increasingly moving, and moving faster and faster from an age of things to an age of thoughts, and age of mind over matter. In this new age, it is the mind of man free to invent, free to experiment, free to dream, that is our most precious resource. The value of silicon chip does not lie in the sand from which it comes, but it lies in the microscopic architecture engraved upon it by ingenious human mind. The most promising superconductors are made from ceramics—their value does not come from their material, but from the brilliant inspiration of a few scientists. It is human imagination that is going to build the 21st century out of sand and clay. Let our scientists, Science administrators and policy-makers ponder whether we will be able to compete with the rest of the nations of the world in the 21st century with the help of policies we had been following during the last forty-five years completely neglecting the education of Science the way it has been done.

Kinds of Perception (See Chart 2.4)

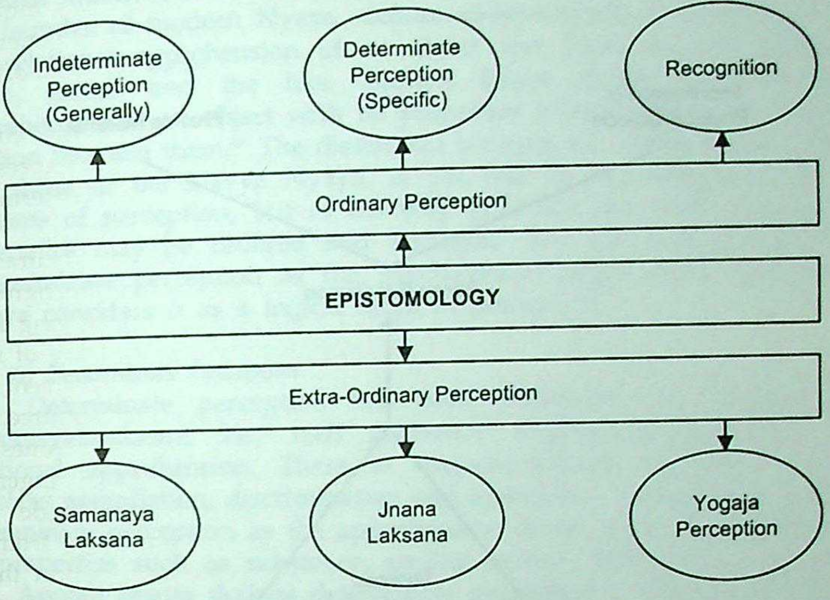
For the nature of the sense-object-contact, perception has been divided by the Naiyayikas into two broad classes, namely, (i) ordinary perception (laukika pratyaksa), and (ii) extraordinary perception (alaukika pratyaksa).

(i) Ordinary Perception

In ordinary perception, there is ordinary intercourse of the sense-organs with their objects. It is of two kinds, namely, external and internal. External perception is of five kinds, viz., visual, auditory, tactual, gustatory, and olfactory. The self perceives colour through the visual organ (eyes), sound through the auditory organs (ears) cold and heat through the tactual organ (skin), taste through the gustatory organ (tongue), and smell through the olfactory organ (nose). The self perceives its qualities, cognition, pleasure, pain, desire, aversion, and volition through the mind, which is the internal organ.

According to another classification, ordinary perception is of three kinds, namely, (a) indeterminate perception, (b) determinate perception, and (c) pratyabhijina or recognition. This division is based upon the

FIG. 2.4

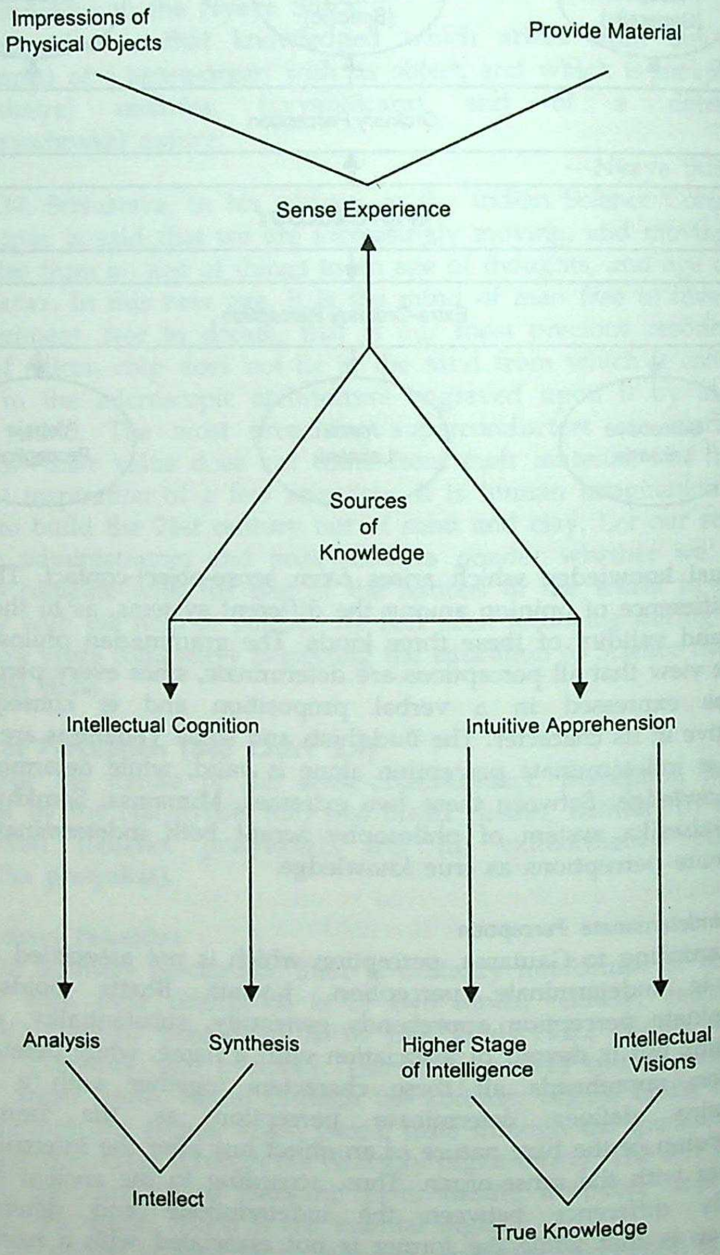

Indeterminate Perception (Generally)
Determinate Perception (Specific)
Recognition
Ordinary Perception
EPISTOMOLOGY
Extra-Ordinary Perception
Samanaya Laksana
Jnana Laksana
Yogaja Perception

perceptual knowledge which arises from sense-object-contact. There is much difference of opinion among the different systems, as to the exact nature and validity of these three kinds. The grammarian philosophers hold the view that all perceptions are determinate, since every perception must be expressed in a verbal proposition and is consequently predicative in its character. The Buddhists and some Vedantins are of the view that indeterminate perception alone is valid, while determinate is false knowledge. Between these two extremes, Mimamsa, Samkhya and Nyaya-vaiṣesika system of philosophy accept both indeterminate and determinate perceptions as true knowledge.

(a) Indeterminate Perception

According to Gautama, perception which is not associated with a name, is indeterminate perception. Jayanta Bhatta holds that indeterminate perception apprehends generality, substantiality, quality and action, but is devoid of association with a name, while determinate perception apprehends all these characters together with a name. Bhasarvajna defines determinate perception as the immediate apprehension of the bare nature of an object just after the intercourse of the object with the sense-organ. Thus, according to the ancient Nyaya, the only difference between the indeterminate and determinate perception is that while the former is not associated with a name, the latter is associated with it. Indeterminate perception is a judgement without words. Indeterminate perception resembles the perception of

FIG. 2.5


Impressions of Physical Objects
Provide Material
Sense Experience
Sources of Knowledge
Intellectual Cognition
Intuitive Apprehension
Analysis
Synthesis
Higher Stage of Intelligence
Intellectual Visions
Intellect
True Knowledge

children and dumb persons. But the Navya-Nyaya makes the distinction between indeterminate and determinate perception more clear. Gangesa, the founder of moderń Nyaya, defines indeterminate perception as the non-relational apprehension of an object free from all association of name, genus, and the like. Annam Bhatta holds the immediate apprehension of an object with its properties without apprehending the relation between them.[24] The distinction between the views of old Nyaya and those of the Navya Nyaya, is not due to any difference in the contents of perception, but to the way in which the same contents of experience may be ordered and arranged. The old Nyaya holds the indeterminate perception as the psychological stage, while the Navya Nyaya considers it as a logical stage of perception.

(b) Determinate Perception

Determinate perception has been mentioned by Gautama as vyavasayatmakama, i.e., well defined.[25] Determinate perception is relational apprehension. There is subject-predicate relation in it. It involves assimilation, discrimination and association. Bhasarvajna defines determinate perception as the apprehension of an object as qualified by its properties such as substance, quality, action, genus, name and the like. Annam Bhatta defines determinate perception as the apprehension of the relation between the qualified objects and its qualifications viz., name, genus, and the like. We would like to say that indeterminate and determinate perception should not be said to be of two kinds of perception, but only as two stages in the perceptual process. At the first stage, the knowledge of the object in contact with the sense-organ is inarticulate and vague. At the second stage, it becomes articulate, definite and capable of being described and named.

(c) Recognition

According to Vatsyayana, "Recognition is the conscious reference of a past and a present cognition to the same object. I see a jar, recognize it as something that was perceived before, and say 'this is the same jar that I saw.[26] The Mimamsakas also hold recognition as a kind of ordinary perception, but they do not distinguish it from determined perception. According to them, recognition is that kind of perception in which the object is determined by the name by which it is called. For the Advaitin, recognition is a perception of the indetermined kind, since there is no predicate of anything about the perceived object in it, but an assertion of its identity amidst changing conditions. But the Naiyayikas hold recognition as a kind of qualified perception, in which the present object is qualified by a distinct recollection of its past experience.

(ii) Extraordinary Perception

In extraordinary perception, the object is not actually present to sense, but is conveyed to it through an extraordinary medium. In it there is a special kind of sense-object-contact (alaukika-sannikarsa). Extraordinary perception is of three kinds, namely, (a) Samanya-laksana-sannikarsa, (b) Jnana-Iaksana sannikarsa, and (c) Yogaja-sannikarsa.

(a) Samanya-laksana is the perception of a whole class of objects through the generic property perceived in any individual member of that class. According to Naiyayikas, when we perceive one pot we perceive the universal 'potness'. The knowledge of the universal is here the medium of sense-object-contact, by which we have a perception of all pots when one is perceived.[27] This type of perception is of great importance in Nyaya system. Without it we cannot explain the knowledge of universal proposition (vyapti), which is presupposed in inference.

(b) The second type of extraordinary perception is called jnana-laksana, which is through association. An object is not directly present to a sense-organ, but it is indirectly present to the senses by the past cognition of it.[28] The visual perception of the sandal brings to consciousness the idea of fragrance by association, which was perceived in the past through the nose. This present perception of fragrance, being due to the past knowledge of fragrance, has been called jnana-laksana perception. The Naiyayikas also explain illusion, e.g., of a snake in a rope, as a case of jnana-laksana perception. In basic sciences like Chemistry, we analyse the presence of gases through jnana-laksana. For example, when we have a smell of rotten eggs, it is presumed that it is Hydrogen Sulphide (H2S gas).

(c) Yogaja perception is the third kind of extraordinary perception. It is the intuitive perception of all objects—past, distant and future—due to some supernormal powers generated in the mind by meditation. There are two kinds of yogic perception: yukta and yunjana. The former is the perception of a yogin who has attained union with God. Such yogic intuition is constant and spontaneous. The latter is the intuitive perception of a yogin who is endeavouring to attain union with God. It requires the aid of concentration to perceive all objects.[29] The reality of yogaja perception is generally accepted in Indian philosophy on the authority of the scriptures.[30] Though modern science has no faith in intuitive perception, yet we can trace some examples even in basic sciences as well. Mr. Kekula has given us the formula of bonzene through his intuition and this formula is the basis of the whole of Organic Chemistry.

Regarding the exact origin of pratyaksa or perceptual knowledge there is, however, a good deal of controversy among the different schools. The ordinary view is that pratyaksa is that kind of knowledge which is generated by the relation of sense (indriya) to some object (indriyartha-sannikarsa-jayna-jnana). In accordance with the Nyaya-Vaisesika view, there are six senses or indriyas—the five external ones of sound, sight, touch, taste, and smell, and the inernal one, mind (manas). It the object is an external one, like a tree, the knower (the soul) directs the mind through the external sense say the eyes, to the tree, and gathers thus the visual knowledge of the tree. If the object to be perceived is internal, say a pleasure (which according to this school is a quality of the soul itself), the soul has simply to attend to it through the manas, which does therefore, in this case, the double duty of an organ of attention as well as that of an internal sense.

2. Inference (Anumana)

Nature of Inference

Inference is the means of knowing something through the medium of the knowledge of some mark (vyapti) between the two.[31] According to Vatsyayana, "It is the knowledge of an object due to a previous knowledge of some sign.[32] The same view has been expressed by Jayanta[33] and Gangesa.[34] In the words of Dr. B.N. Seal, "Inference is the process of ascertaining, not by direct observation, but by the instrumentality or a mark, that a thing possesses a certain character.[35]

Inference is accepted by most of the Indian philosophical systems. The Buddhists take inference to consist in the perception of that which is known to be inseparably connected with another thing. Such inseparable connection between two things is due either to the law of casualty or the principle of essential identity (tadutpatti and tadatmya). Jainas hold that inference is the method of knowing an unperceived object through the perception of a sign of knowing an unperceived object through the perception of a sign and the recollection of its invariable concomitance with that object. The Samkhya, the Yoga, the Mimasa and the Vedanta systems also define inference as the knowledge of one term of a relation, which is not perceived, through the knowledge of the other term which is perceived and is explicitly understood as invariably related to the first term.

But the Carvakas do not admit the validity of the inferential knowledge. According to them, inference may give us probable knowledge as there remains a doubt with regard to the existence of inferred object until it is verified by direct experience. There is hardly any vyapti which is not conditional. While stating the vyaptis, we neglect the conditions. Hence all inferences based on them are doubtful. Moreover, there is no guarantee that what has been true in the past will also be true in the future.[36]

In reply to the Carvakas' objections against inference, it is pointed out by the Naiyayikas that even the theory that inference is invalid can be established only by an inference. As a matter of fact the Carvakas employ the method of inference more than once in their philosophy. For example, it is by means of inference that they can know that other people differ from them with regard to the question of inference, or that other sources of knowledge are all fallacious as inference, or that God, soul, etc., do not exist because they are not perceived. So the Carvakas' object is suicidal. Regarding Carvakas' objection that inference is sometimes misleading, it may be pointed out that even perception is sometimes misleading.[37] So the only reasonable conclusion is that any source of knowledge, be it perception or inference, should be regarded as valid in so far as it yields a knowledge that does not prove misleading. While stating the vyaptis, we never neglect the conditions because in all inferences we remain within the field of our knowledge previously acquired through perception. The knowledge gained by such inference cannot be doubtful and, hence, inference is regarded as a source of new knowledge by Indian logicians.

APPLICATION TO SOCIAL SCIENCES

Except the Carvakas, all other schools consider inference to be a valid and important source of knowledge. In reply to the Carvaka objections against inference, it is pointed out (1) that even the theory that inference is invalid can be established only by an inference, so the Carvaka theory is suicidal, and (2) that it is not impossible universal propositions (as premises necessary for deductive inference) with the help of various inductive methods (discussed below).

Gautama and his later followers of the Nyaya school devoted special attention to inference, which occupied these thinkers almost exclusively for centuries, particularly in Mithila and Bengal. The views of other schools were greatly influenced by them. In the course of their intensive cultivation of this narrow field of inference, they discovered many subtleties, and developed above all a unique algebraic language for the precise formulation of ideas. This became the standard language of philosophical discussion in all schools and made all later philosophical treatises unintelligible to the general reader. In social sciences, it is called generally Survey Research Method. After the data has been collected, analysed and processed, we have to draw broad conclusions that may be used for the purpose of deduction later on. The method of generalization may be broadly classified into two groups: (1) logical methods; and (2) statistical methods. According to Wolf, "Science is not interested with individual objects or individual groups of objects as such. It is primarily concerned with the types, kinds or classes of objects and events which the individual object or event is treated merely as a specimen or an instance. The aim of science is to trace order in nature. To this end science seeks to ascertain the common characteristics or types of objects and general laws or conditions of events." Complete universality is only a myth and is rarely achieved in social sciences.

Prof. Murli Manohar Joshi observes that as a physicist I have found that in stretching the limits of my understanding of the cosmological mysteries of the universe I have profited immensely by a deeper study of some of our ancient texts. I have found striking parallels in terms of language as well as conclusions between the latest developments in quantum theory and Vedantic and Upanisadic insights. This is not the occasion to demonstrate these parallels as I have done so many times elsewhere. What I find ironic is that although modern science now readily acknowledges the value of ancient Indian Knowledge systems in opening new doors to discovery, a majority of our social scientist still cling to the strait jackets of the Popperian critical rationalist discourse and dismiss the use of ancient Indian philosophical traditions as an attempt to valorize primitivism. This is a reflection of a colonized mindset. One of the challenges before our social scientists, therefore, is to overcome this taboo reaction and ask themselves the question raised by Kierkegoard. "Is it not possible that my activity as an objective observer of nature will weaken my strength as a human being?" Our spiritual sciences offer ways in which the quest for the highest truth is not merely a quest for objective certitude but inseparably linked to the development of personality for the attainment of the highest, freedom, bliss and wisdom. We ignore our civilizational traditions, therefore, at our own peril.

This is neither the place not the time to delve into the intricacies of ancient Indian epistemology, Suffice it to say that between S-amkhya, Nyaya-Vaisesika, Yoga, Mimamsa, Vedanta, Advaita and Buddhist and Jainist systems of thought and the hundreds of schools within each of them there is an epistemological tradition of such stunning complexity, depth, range and reach that it is a tragedy that we have not built on these traditions to create a satisfying, contemporary indigenous social theory. Similarly, little use has been made of the extremely sophisticated art of philosophical disputation elaborated by Aksapada in his Nyaya Sutra and subsequently developed by philosophers like Vatsayayana and Uddyotekara. Although the concepts of pramana and prameya and the associated categories of samsaya, prayojana, drstanta, siddhanta, avayava, tarka, nirnaya, vada, vitanda, hetvabhasa, chala, jati and nigrahastana offer remarkable insights for developing a contemporary methodologies for the social sciences, our social scientists have found it easier to follow the more fashionable western analytical categories.

Western logic does not consider it its business to inquire whether the premise and the conclusion of an argument are true. It is solely concerned with determining whether a given argument is valid, . . . In sharp contrast Indian logic is at once formal and material. Indian logicians reject the verbalist view of logic - the view that logic is only concerned with thought—forms and symbols and not with content and referents . . . whereas the Indian view is based on the conviction that logic is an instrument for the discovery and understanding of reality, and not a mere formal discipline wholly unrelated to the world, ... the Western traditions, having sharply divided the formal from the empirical, is faced with the serious problem of accounting for the fact of the application of logic in the study of the world.

Puligandla, 1997: 197-8

Kinds of Inference

Gautama mentions three kinds of inference: (a) purvavat, (b) sesavat, and (c) samanyatodrsta. But he has not defined them anywhere in the Nyaya-sutra. Vatsyayana offers two alternate interpretations of these terms. According to his first interpretation, 'purvavat' means inference of an effect from its cause, i.e., the inference of the impending rain from the rising clouds: 'sesavat' means the infernece from its effect, i.e., the inference of the fall of rain in the upper regions of a river from seeing the river in spate. Thus, these two kinds of inference are based on the casual relation. But samanyatodrsta is based on non-casual relation. We may infer the cloven hoof of an unknown animal simply by seeing its horns. Similar instances depend not on a causal connection, but on certain observed points of general similarity between different objects of experience.

Vatsyayana has given alternative explanation also of these three terms. Having perceived two things together, when we infer the existence of one from seeing the other, we have 'purvavat' inference. For example, the inference of fire from smoke is inferred as purvavat kind. The 'sesavat' inference is by elimination. By 'sesa'. Vatsyayana means 'remained'. For example, by the process of elimination, we infer that sound belongs to the category of 'quality'. In Chemistry, we confirm the presence of nitrogen gas also by the process of elimination. When all gases are found absent, then we confirm that there is nitrogen gas only.

Samanyatodrsta is the inference of an unperceived object from the mark which is perceived. For example, we infer the existence of the soul-substance from the qualities of cognition, pleasure, pain, desire, aversion and volition which must inhere in a substance. These qualities are similar to other qualities. Therefore, they must inhere in a substance. This substance is the soul.

Gangesa mentions three kinds of inference: (a) anvayavyati-reki, (b) kevalanvayi, and (c) kevalavyatireki.

(a) Anvayavyatireki is explained as where the vyapti is established with the positive as well as negative examples. For example, yatra dumah, tatra vahnih as in the mahanasa (kitchen). With such positive arguments it is called anavayanumana; and if the same is proved through negative example, as yatra vahnir-nasti, tatra dhumopi nasti, as in a lake, then this is called anvayavyatireki anumana. Here the vyapti is established both positively and negatively. This is the best method of discovering the vyapti between hetu and sadhya. This method leaves no doubt in the mind of the observer.

(b) But in cases where anvaya-vyapti alone is possible and no vyatireka, that is called kevalanvayi. As for intance, sound has a name, because it is an object of knowledge, as a pot. Here, there is possibility of having a negative argument like 'yatra abhidheyam na, tatra prameyameyamapi na'. No example is available here. So, such an argument is not valid. Hence, it is only called kevalanvayi.

(c) Similarly, an inference, where only negative is possible and no positive, is called kevalavyatireki. As, for example, what is not different from the other elements has no smell. The earth has smell. Therefore, the earth is different from the other elements. In this inference, the reason 'smell' is the uncommon attribute of the subject 'earth', it is co-extensive with the subject, there is no similar instance in which it may exist. So it is called kevalavyatireki.

Annambhatta divides inference into two kinds, viz., (a) inference for oneself (svartha), and (b) inference for others (parartha).

(a) Svarthanumana is meant to convince one's own self about the existence of an object. For example, a person happens to see with his own eyes in kitchens and other common places smoke always accompanied by fire, by which he comes to a conclusion that wherever there is smoke, there is fire. Whenever he goes out and happens to see smoke, there is fire. Whenever he goes out and happens to see smoke coming out of a mountain, his previous memory of the concomitant relation between smoke and fire arises and he comes to a conclusion that here also there is fire. Thus, this is the psychological process of inference for one's own sake.

(b) Pararthanumana is a logical process in which we try to convince others of its truth by stating all the members of a syllogism in a formal manner. Here are five members of the Nyaya syllogism, namely pratijna, hetu, udaharana, upanaya and nigamana. Pratijna or proposition is the logical statement which is to be proved e.g., the hill is on fire.[38] But it should be noted that pritijna should not be opposed to direct perception or the testimony of the scriptures. Dignaga says that unintelligible, self-contradictory and self-evident propositions cannot serve as thesis, Kanada expressed the same opinion that the proposition should not contain any unfamiliar terms, should not be opposed to well-established truths, or one's own convictions.

Hetu, the second member of the syllogism, states the reason for the establishment of the proposition, e.g., 'because the hill has smoke'.

The third member of the syllogism is udaharana (example) which is a universal proposition showing the invariable concomitance between hetu and sadhya:

'whatever has smoke has fire, e.g., a kitchen'.

The fourth member upanaya is the application of the universal concomitance to the present case e.g., 'so like kitchen, the hill is smoky'.

Lastly, nigamana is the conclusion drawn from the preceding propositions: 'therefore, the hill is on fire'.

The above mentioned five parts make up a complete demonstrative infernece and leave no doubt in the mind of the person before whom the argument is placed. These five parts are accepted in Samkhya[39] and Vaisesika[40] systems also.

Vatsyayana points out that some old Naiyayikas regarded the syllogism as consisting of ten members. In addition to the five given above, the following are included:

(1) Jijnasa or the desire to know the truth of the proposition, whether the hill is on fire in all its parts or in only some;
(2) Samsaya or doubt about the reason, whether after all that which we regard as smoke is always a concomitant of fire, since it is not present in a red-hot iron ball;
(3) Prayojana, or purpose of drawing the conclusions; and
(4) Samsaya-vyudasa or the removal of all doubts about the relation between hetu and sadhya.

According to Vatsyayana, these five additional members of the syllogism are, unnecessary for proof, though they help to make our cognitions clear. They have in view the psychological process. Jinasa is undoubtedly the starting point of all knowledge, but such desire is not an integral factor of inferential reasoning.[41] Similarly, samsaya is only a condition of knowledge. The validity of all knowledge depends on the validity of the methods of knowledge (sakyaprapti). But the validity of the methods cannot be put forward as a part of the argument to prove a conclusion. So also the prayojana, which an inference serves, is no part of the inference itself. Samsaya-vyudasa consists in repudiating all views which contradict the conclusion of an inference. This serves to lend indirect support to the conclusion, but does not really prove it. Hence, these additional five members mentioned above, are unnecessary for inferential reasoning, though they indirectly help us.[42]

The process of inferential reasoning according to Nyaya syllogism corresponds roughly with the syllogistic analysis of Aristotle. Prof. Keith[43] has suggested that the Nyaya syllogism is influenced by Greek thought. But it is absolutely false. We find the development of the Nyaya inference even in pre-Aristotelian works of the Hindu and the Buddhist thinkers,[44] so it is difficult to accept the theory of 'borrowing' from Greece. The view that vyapti, was introduced by the Buddhist logician Dignaga who was influenced by Greek thought is also wrong. Vyapti was recognized much before Dignaga.[45] It may be frankly said that the similarity between the two is due to a parallel development of thought and Indian logic has its natural growth. In the words of Max Muller, "that we must here also admit the existence of undesigned coincidences to a much larger extent than our predecessors were inclined to do. We must never forget that what has been possible in one country is possible in another also." This view becomes more strong when we realize that there are fundamental differences between the Greek and the Indian syllogism. In Nyaya syllogism the vyapti is always accompanied by illustrations, and hence the argument is a combination of both formal and material elements, while the Aristotelian syllogism is primarily formal. The Aristotelian syllogism is composed only of three propositions, whereas the Nyaya syllogism consists of five propositions. The example of the Nyaya syllogism is totally absent in the Aristotelian syllogism, Nyaya syllogism is an inference for others, while the Aristotelian one is not.

Hence, we may say that the Indian syllogism seems to be comparatively more natural, practical and convincing than the Aristotelian syllogism. In actual thinking we do not argue in the form of Aristotelian syllogism but in the form of Indian syllogism.

Vyapti

Vyapti literally means pervasion. It is the pervasion of the middle term e.g., smoke by the major term e.g., fire. Hence the middle term is called 'vyapya', and the major term is called 'vyapaka'. Wherever there is smoke, there is fire. But wherever there is fire, there is no smoke. There are cases of smokeless fire (e.g., red hot iron ball). Thus, smoke is pervaded by fire, but fire is not pervaded by smoke.

A vyapti betwween terms of unequal extension, such as smoke and fire, is called asamavyapti or visamavyapti. It is a relation of non-equipollent concomitance between two terms, from one of which we may infer the other, but not vice versa. We may infer fire from smoke but not smoke from fire. On the other hand, a vyapti between two terms of equal extension is called samavyapti in which we may infer either of them from the other e.g., 'nameable' and 'knowable'. Whatever is nameable is knowable and *vice versa*.

Now, the question is: How do we get a universal proposition?

Indian systems of philosophy take inference as a process of reasoning which is not only formally valid but also materially true. Hence in an inference of any kind, the question arises: How do we get the universal proposition like "all smoky objects are fiery", or "all men are mortal"?

The Buddhists hold that vyapti is based on the principles of causality (tadutpatti) and identity in essence (tadatmya).[46] To determine the causal relation, the Buddhist adopt the method of pancakarani which is as follows: (a) neither the cause nor the effect is perceived, (b) the cause is perceived, (c) immediately, the effect disappears.[47] Similarly, the universal relation is also based on the law of essential identity. Identity does not mean mere repetition of the same thing, e.g., A is A. Nor can there be any identity between things that are absolutely different, e.g., a horse and a cow. By identity we mean the relation between two different things that co-exist in the same locus.

The Naiyayikas reject the Bauddha method of ascertaining vyapti. According to them, there are many cases of vyapti, which are independent of the notions of causality and identity. There is a universal relation of succession between day and night or between the different seasons, or between sunset and the appearance of stars. Further, the relation of identity can hardly be treated as ground of inference. The two things being identical, we should be able to infer either of them from the other. The tets of the pancakarani applies when all the conditions of a certain relation remain the same. But it is only with regard to the perceptible conditions. Hence, it is not always safe to infer a particular cause from an effect as such.[48]

The Advaita-vedanta holds that vyapti is derived from the uncontradicted experience of agreement in presence between two things. When we find that two things co-exist, and that there is no exception to their relation, we may take them to be invariably related to each other. The Nyaya agrees with the Vedanta but it supplements the uncontradicted observation of agreement in presence by that agreement[49] in absence, tarka or indirect proof and by samanyalaksana perception. The Nyaya method of induction may be analyzed into the following steps:

1. Anvaya

First, we observe that there is a uniform agreement in presence (anvaya) between two things, e.g., wherever there is smoke, there is fire.

2. Vyatireka

Secondly, we see that there is a uniform agreement in absence (vyatireka) between them, e.g., where there is no fire, there is no smoke.

3. Vyabhicaragraha

Thirdly, we do not observe any contrary instance in which one of them is present without the other (vyabhicaragraha). From this we conclude that there must be a natural relation of invariable concomitance between the two things.[50]

4. Upadhinirasa

The fourth step of the Inductive method is elimination of upadhis on which the relation may be possibly dependent. An upadhi is a term which is co-extensive with the major but not with the middle term of an inference.[51] Thus when one infers the existence of smoke from fire, he relies on a conditional relation between fire and smoke, since fire is attended with smoke on condition that it is fire from 'wet fuel'. The condition of 'wet fuel' is always related to the major term 'smoke' but not so related to middle term 'fire', as there are cases of fire without 'wet fuel'. Hence to make sure that a certain relation of uniform concomitance between two things is a vyapti, we must eliminate all conditions. This can be done by repeated observation of their agreement in presence and absence under varying circumstances.

5. Tarka

If even after repeated observation we have any doubt as to there being vyapti, we are to have recourse to tarka.

6. Samanyalaksana Perception

An inductive generalization must be ultimately based on the knowledge of the essential nature of things, i.e., the class essence or the universal in them. Hence it is that the Naiyayikas finally establish an induction by samanyalaksana perception. They hold that a universal proposition like "all men are mortal" must be due to the perception of the universal "manhood" as related to 'morality'. So we may say that the essence of induction is not an inference of the form "some men are mortal, therefore, all men are mortal." This is not a logically valid inference, because there is an obvious illicit distribution of the subject term men. On the other hand, induction is a process of generalization from the particulars of experience through the knowledge of the class-essence or universals underlying such particulars.

Hetvabhasa (fallacies)

A hetvabhasa is defined to be a false hetu with only an appearance of a hetu which makes inference impossible and illegitimate. Such a hetu is found to be fallacious because it does not fulfil all the conditions of a valid ground of inference.

In order to have a valid knowledge by inference, hetu must not be fallacious. Varadaraja mentions five essential characterstics of a valid hetu so that it may become capable of establishing a sadhya. These five essential characterstics are as follows:

1. Paksadharmata, i.e., the hetu must be found to be present in the subject (paksa).
2. Sapaksasattva, i.e., the presence of the hetu in the positive instances homogenous with the proven.
3. Vipaksasattva, i.e., non-presence of the hetu in the positive instances homogenous with the proven.

4. Abadhitavisavatra, i.e., non-incompatibility with the minor. In other words, the presence of the sadhya should in no case be invalidated by any other more authoritative means in no case be invalidated by any other more authoritative means of proof (perception or testimony). Not should be sadhya be apparently absurd.
5. Asatpratipaksatva, i.e., absence of counteracting forces. This means that there should be nothing else present in the paksa alongwith the hetu, which is invariably connected with the absence of the thing whose presence we are going to establish.

All these above-mentioned characteristics are necessary for a valid hetu. The deficiency of a hetu in any one of these five characteristics gives rise to a fault in inference which makes the hetu advanced a faulty one.

Gautama classifies all the inferential fallacies under five heads, namely, savyabhicara, viruddha, satpratipaksa or prakaranasama, sadhyasama or asiddha and kalatita. In modern school of Nyaya, the first four kinds of fallacies bear the same names and the same significance but the last kind of fallacy is not only called by different name (badhita), but bears substantially different meaning.

1. *Savyabhicara*: In it the hetu is founded to lead to no one single conclusion, but to different opposite conclusions. It is not uniformly concomitant with the major term, but is related to both the existence and the non-existence of the major term. It is, therefore, called anaikantika. From such a middle term we can infer both the existence and the non-existence of the major term.

2. *Viruddha* (self-contradicting) hetu is that which, though offered to establish a sadhya, actually proves the non-existence of the sadhya by virtue of its being invariably connected with the negation of the sadhya.

The distinction between the savyabhicara and the viruddha is that while the former only fails to prove the conclusion, the latter disproves it or proves the contradictory proposition.

3. *Satpratipaksa* hetu is contradicted by another hetu. The satpratipaksa hetu is different from the viruddha hetu. In case of viruddha the one and same hetu proves the contradactory of what it ought to prove, whereas in the case of satpratipaksa it is another hetu which proves the contradictory of the sadhya. That is, the viruddha hetu is irreconcilable with the sadhya in the same inference while the satpratipaksa hetu is inconsistent with the sadhya in a counter inference.

4. *Asiddha* hetu is also called sadhyasama, i.e., the unproved reason. The sadhyasama hetu is one which is not yet proved, but requires to be proved like the sadhya. This means that the sadhyasama hetu is not a proved or an established fact, but an asiddha or unproved assumption. The fallacy of asiddha occurs when the hetu is wrongly

assumed in any of the premises, and so cannot be taken to prove the truth of the conclusions.

5. *Kalatita* literally means a hetu which is vitiated by the lapse of time. In this fallacy, the hetu consists of two or more events which succeed one another in time, and therefore becomes inappropriate in the order of time.

Badhita hetu of the modern Nyaya is contradicted by some other source of valid knowledge.

The fallacy of satpratipaksa is different from this fallacy of badhita, because, in the former one inference is contradicted by another inference while in the latter an inference is contradicted by perception or some other non-inferential source of knowledge.

3. COMPARISON (UPAMANA)

Comparison is the third source of valid knowledge accepted by the Nyaya system. It is the means by which we gain the knowledge of a thing from its similarity to another things previously well-known.[52]

Comparison is the relation between the names and the objects denoted by them. Annambhatta says: "Upmana is the source of our knowledge about the relation between a word and its denotation."

Two factors involved in an argument by comparison are: (1) the knowledge of the object to be known, and (2) the perception of similarity. According to ancient Naiyayikas, the first factor is the principle cause of the knowledge, while the modern Naiyayikas regarded the perception of similarity more important. Uddyotakara and Vacaspati are of the view that in upamana, the new knowledge takes place through the recognition not only of similarity but also of dissimilarity, as when we identify a horse which is different from the cow since it has not cloven hoofs. Gangesa also recognizes these two kinds of comparison when he defines comparison as "the knowledge that a word denotes the generic character of an unfamiliar object which co-exists with its similarity or dissimilarity with a known object." Varadaraja mentions a third kind of upamana viz., comparison based on certain qualities. The special qualities enable us to discriminate the things denoted by the name from all other things and consequently apply the name to just that class of things.[53] Visvanatha mentions another kind of upamana which is slightly different from the above three. Here upamana consists, not in the knowledge of the denotation of a word, but in that of some unknown property of an object through its similarity to a known thing.

Upamana as Different from 'Analogy'

Since the perception of similarity plays an important part in upamana, it is sometimes held that upamana corresponds to analogy of western logic. But from the Nyaya account of upamana as given above it will appear that it does not really correspond to an analogical argument. In analogy we infer one resemblance from other resemblances like this: S is P; P has got a characteristic X; therefore, S also must have X as its characteristic, although it is not already known to us. That is, we expect certain qualities to be present in some objects simply because those qualities are found to be present in other objects which resemble the former in many other aspects. This kind of thinking is quite different from what has been called upamana in Indian logic. Comparison is not analogy, though both are based on similarity. First, unlike analogy, comparison depends upon testimony. Secondly, unlike analogy, comparison yields the knowledge of the relation between a name (samjna) and an object (samjni). It does not lead to the knowledge of resemblance between things, but to that of the denotation of a word, or to the application of a name to a class of objects. Even the special kind of upamana mentioned by Visvanatha is not a knowledge of resemblance, but is the identification of an object from a given description. Thirdly, unlike analogy, comparison sometimes depends upon dissimilarity. In this way comparison is quite different from analogy.

Upamana as an Independent Pramana

Gautama mentions upamana as a distinct and independent means of knowledge. But some systems of Indian philosophy do not recognize it as an independent source of knowledge. The Carvakas contend that upamana is not a pramana at all, since it cannot give us any true knowledge about the denotation of words as maintained by the Naiyayikas. According to them, mere resemblance, whether it is complete, considerable or partial, is not enough to justify an argument by comparison. The nyaya replies that comparison does not depend upon the quantity of similarity, but it depends upon perceived similarity of an unknown object with a well-known object, which indicates the relation of an unknown object with a particular name. Secondly, the Naivayikas do not deny that upamana sometimes leads to wrong judgements. The wrong judgements of comparison may, like those of perception and inference, be explained as due to the wrong application of a right principle. So we should not deny that upamana is a valid source of knowledge.

According to Buddhist logicians, upamana is a valid but not an independent source of knowledge. It can be explained as a combination of perception and verbal testimony. There are two factors in upamana, namely, the knowledge of the similarity or dissimilarity between two classes of things and the knowledge of the fact that things of a certain class are denoted by a certain word. As to the first factor, we see clearly that it is given by perception. When we see two things together we perceive that they are similar or dissimilar to each other. As to the second factor, it is derived from testimony. Hence upamana need not be given the status of an independent source of knowledge. Uddyotakara criticizes the Buddhist view that in upamana neither the perception of similarity nor the verbal knowledge of the denotation of a word is a vital point but the recognition of certain objects, not known before, as belonging to a class and denoted by a class-concept. The similarity of those objects to other things may be perceived and the class-concept may be given by the testimony but the application of the concept to a particular class of things cannot be due to perception or testimony. Hence, Buddhists' view is not tenable.

The Vaisesika and the Samkhya systems explain upamana as a form of inference. According to these systems, upamana has three factors. First, there is an authoritative statement. Secondly, there is the observation which is perceptual in character, since it is due to sense-object contact. Thirdly, there is the knowledge that the word denotes the class. This whole process may be shown in the form of a syllogism:

> All animals resembling the cow are gavayas,
> This is an animal resembling the cow,
> Therefore, this is a gavaya.

Naiyayikas reject this view and point out that the ultimate aim of upamana is to get the knowledge of the denotation of a word to a specific class of objects on the basis of authoritative statements and this can be got without the knowledge of vyapti which is essential in inference. Secondly, in upamana, there is the knowledge of similarity 'a wild cow is like a cow', while in inference there is no such knowledge of similarity, 'a fire is like a smoke'. In upamana, we do not infer but compare. Hence, we cannot reduce upamana into inference.[54]

The Jainas also do not recognize upamana as an independent source of knowledge but include it under recognition. It is clear that such knowledge stands for that which is conditional by perception and memory. Prabhachandra criticizes the Nayaya view of comparison. The verbal statement of a forester 'a wild cow is like a cow' produces the knowledge of the relation of the name and the object when a wild cow is perceived in a forest, the impression of that knowledge is revived, and the perception and the recollection produce the cognition 'a wild cow is like a cow'. But this view is wrong. The knowledge of the relation of the name (gavaya) and its object is not acquired from he verbal statement 'a wild cow is like a cow', because a wild cow is not perceived at the time, and when it is perceived for the first time, it cannot be recognized. Hence it is wrong to include comparison in recognition. It is neither perception, nor recollection, nor recognition.

The Mimamasakas and the Vedantins though recognize upamana as a separate source of knowledge, yet they explain it in a different way. Upamana is regarded by them as cognizing and similarity with the object perceived of the similarity of the cow in the gavaya. The new knowledge acquired here is that'the cow is similar to this animal called 'gavaya' and the instrument of this knowledge is the knowledge that "the animal called the gavaya is similar to a cow", which formerly was not heard and now is directly perceived. According to the naiyayikas, the resultant knowledge is not the knowledge of the similarity of the cow with the gavaya now perceived, as the mimamsakas say, but the knowledge that the word 'gavaya' denotes the animal perceived. This view seems to be more reasonable. Otherwise the pramana loses its value in giving us some new information. One can very easily say without perceiving a gavaya that if a gavaya resembles a cow, the cow must also resemble the gavaya. Hence we conclude with the naiyayikas that upamana is an independent source of our knowledge of the denotation of words.

4. TESTIMONY (SABDA)

Testimony (Sabda)

Except the Carvaka school and Kanada, the founder of the Vaisesika (who admits only perception and inference), the Indian logicians accept testimony or authority as a third source of valid knowledge. Kanada thinks, like Western logicians, that knowledge from authority is really a kind of inference, based on the reliability of the authority. But the Naiyayikas and others points out that the process by which such knowledge is derived is so different from that of inference that it deserves a separate status. For, in other that sabda or verbal statement may yield knowledge the following conditions have to be fulfilled:

(a) Each word of a sentence must carry some meaning which is by itself incomplete and raises some expectation.
(b) The meanings of the different words should possess mutual comptability (yogyata) and thereby fulfil the expectation raised by one another.
(c) The words to be construed must have mutual proximity (sannidhi) that is, they should not be written or uttered at long intervals. (Dhirendra Mohan Datta, *op. cit.*, p. 556).

Nature of Testimony

Testimony has been defined by Gautama as 'Aptopadesah sabdah, that is, the assertion of a reliable person is what is meant by sabda.[55] The apta, or the reliable person is one who, having had direct proof of a certain matter, desires to communicate it to others who thereby understand it. They may be of any caste or race 'rsis, aryas or mlecchas."[56] It is evidently a very comprehensive definition of sabda, and includes not only the scripture which is regarded as the word of God; but also the statements made by worldly persons who know the truth and communicate it correctly. The Vedas are considered as authoritative because they are regarded by the naiyayikas to be the words of God. In the same way the statements of any worldly person will be authoritative when it is certain that the person is a trustworthy one. Hence the validity of sabda pramana depends on its being based on the statement of a trustworthy person, human, or divine. But it should be clear to us that the possibility of the sabda pramana depends on the understanding of the meaning of the statement given by a trustworthy person. Only by understanding the meanings of the statements we can acquire the knowledge of the objects. Annambhatta has rightly said that sabda, as a source of valid knowledge, consists in understanding the meaning of the statement of a trustworthy person.[57] Hence the special cause of sabda is the knowledge of words which leads to the knowledge of objects through its function of recalling the meaning connected with words or sentences.

Division of Testimony (Sabda)

According to Gautama, it is of two kinds, namely, drstartha or that relating to perceptible objects and adrstartha or that relating to imperceptible objects. The former objects are found in this world. The latter are found in the next world, such as heaven, hell, transmigration, etc. According to other Naiyayikas, it can be classifed into the secular (laukika) and the scriptural (vaidika). Secular testimony is the testimony of human beings and may, therefore, be true or false. Only that which proceeds from trustworthy persons is valid but not the rest. In vaidika testimony, we have the words of God. The Vedas are created by God and are, therefore, valid on all points. All Naiyayikas, however, agree that sabda must be based on the worlds of trustworthy persons, human or divine. The Samkhya, Yoga, Mimamsa and Vedanta schools of thought agree with the Nyaya in regarding verbal testimony as an independent source of valid knowledge, but they all differ from the Nayaya as to the denotation of sabda. These schools hold that the Vedas are authoritative not because they are words of trustworthy Divine person, but because they are not known to have been created by any person (apauruseya) and are eternal. However reliable a person may be, his statements cannot be regarded by these schools as a sabda. But the naiyayikas think that the Vedas, being composed of words and sentences, must have an author. That author is God. But that does not preclude men from being reliable with regard to what valid knowledge they may have and may convey to others. We often rely on the statements of others whom we regard as apta in cases where direct perception or influence is not possible.

Testimony as an Independent Pramana

Except the Carvaka, the Buddha and the Vaisesika schools, all other systems of Indian philosophy accept testimony as an independent source of valid knowledge. The Carvaka argues that so far as testimony gives us knowledge of things which are actually perceived, it is valid, but if testimony suggests the existence of transcendental entities or unperceived objects, it is invalid. The Vedas are not authoritative. They are the inventions of cunning priests who conjured heaven and hell, virtue and vice, and inculcated the performance of sacrificial rites by laymen in order to earn their own livelihood. In this way, we shall have to believe in many absurd and fictitious objects about which any fool may tell us. Hence testimony should not be recognized as a means of knowledge.[58]

According to Buddhist logicians, testimony is not an independent source of knowledge. When we speak of credible assertion, we mean either that the person who utters it is credible or that the fact that he utters is credible. If it is the former, we have a case of inference; if it is the latter, we have a case of perception.

Kanada and Prasastapada hold that testimony is an inference as the meaning of a word is not perceived. Testimony can convey the knowledge of the past, the present, and the future like inference.

But Nyaya rejects all these views advanced by above-mentioned systems. According to Nyaya, testimony is not only the statement of reliable persons only but also the statements of the scriptures (Vedas), which are regarded as the statements made by God. It is argued that Vedas are authoritative, because they are accepted as valid by the great saints, who practiced the Vedic sacrifices with earnestness and perfection.

Moreover, testimony has to do with transcendental realities which cannot be known by perception or inference. Our knowledge would be very meager if we were to depend solely in our experience and reason and discard the valuable knowledge obtainable from the statements of specialists, experts and the scriptures. To those systems which include testimony into perception or inference, Nyaya advances that testimony is the knowledge of words while perception is due to sense-object-contact, inference to the knowledge of invariable concomitance and upamana to the perception of similarity or dissimilarity. In testimony, words do not accompany their objects, and there is no direct relation between them. If there were a natural relation between words and objects then it would be invariable. But we see that the same object is denoted by different words, and the same word conveys different meanings in different places. So there is no natural relation between them. It is determined by convention, which is ultimately due to the will of God at the time of creation that particular words will mean particular objects.[59]

Annambhatta and Visvanatha point that the process by which verbal knowledge is derived is so different from that of inference that it deserves a separate treatment and status. In order that sabda may yield knowledge, the following conditions have to be fulfilled:

(a) Akanksa

Each word of a sentence must carry some meaning which is by itself incomplete and raises some expectation.

(b) Yogyata

The meanings of the different words should possess mutual compatibility and thereby fulfil the expectation raised by one another.

(c) Sanniddhi

The words to be construed must have mutual proximity.

(d) Tatparya

The knowledge of the meaning of a sentence depends upon the knowledge of the intention of the speaker. The intention of the speaker should be gathered from the context. This is in case of ordinary sentences used by human beings. But for the understanding of the Vedic texts we are to take help of the logical rules of interpretation systematized by the mimamsa system.

Now, it is quite clear that above-mentioned conditions of verbal cognition do not involve the knowledge of vyapti which is essential for inference. So the knowledge derived from the words of an authority cannot be the same as inference. We should, therefore, recognize sabda as an independent and ultimate source of knowledge like perception, inference and upamana.

Nyaya's Stand on the Other Means of Knowledge Accepted by Other Indian Philosophical Systems

Nyaya system accepts the above-mentioned four means of knowledge as distinct and independent. But the Prabhakaras add arthapatti, or presumption, and the Bhatas and the Vedantins abhava, or non-existence to these four pramanas. Pauranikas regard tradition (aitihya) and probability (sambhava) also as valid sources of knowledge. But the Naiyayikas believe that all these forms of knowledge are comprehended by the four pramanas.

(a) Aitihya

Tradition means the continuous communication of a body of ideas and belief constituting a particular tradition. It is accepted as true on the authority of some persons, whoever they may be. We believe in tradition because we trust that it must have originally emanated from some reliable persons. As such, tradition is a form of vague testimony, in which we know certain things on the authority of some unknown persons. Hence tradition according to naiyayika is brought under testimony.

(b) Sambhava

It may mean either probable knowledge or the knowledge of numerical proportion. In the first sense, it is illustrated when we expect rain from the appearance of clouds in the sky. Here we think that there will probably be rainfall because we know that clouds are generally followed by rain. But such probable knowledge is not valid knowledge and so requires no pramana to explain it. In the second sense, however, sambhava means the knowledge of the part from that of the whole within which it is included. Thus we know that there is a hundred within a thousand, a kilogram within a kilo. Such knowledge is really inferential in character, since it depends on the knowledge of vyapti between the part and the whole. Hence, sambhava need not be taken as a separate source of knowledge other than inference.

(c) Arthapatti

Arthapatti or presumption is getting at a new fact or presuming something (apatti) on the basis of another fact (arthat). It is assuming a thing not itself perceived, though implied by another thing perceived or inferred. The fat Devadatta does not eat in the day. The implication is that he eats in the night, since it is impossible for one to be fat if one does not eat at all. The Prabhakaras, who regard it as an independent means of knowledge, view it as a disjunctive hypothetical syllogism. But according to Naiyayikas it is an example of a negative inference which establishes the absence of the middle term through the absence of the major. According to Bhasapariccheda, arthapatti is accomplished through the recognition of a negative relationship between the middle and the major. It may be reduced to the following syllogism:

He who does not eat at night while fasting by day is not fat.
This man who fasts at day is fat.
Therefore, this man is not one who does not eat at night, i.e., he eats at night.

Thus, arthapatti may be reduced to vyatireki inference.

(d) Abhava

Abhava means not mere negation but contrast. It is a contrast between what exists and what does not exist.[60] Of two contradictory things, the non-existence of one establishes the existence of the other. hus the non-existence of rain brings about the cognition of the existence of the connection of the clouds with high winds; which prevents rainfall. It is on account of the obstruction offered by high winds that raindrops do not fall to the ground, as they otherwise would by the force of gravity.[61] If we infer the non-existence of a thing from the existence of another, it is only a case of inference.[62] Vatsyayana says: 'At that time the existent thing is cognized, the non-existent thing is not cognized', that is to say there is non-cognition of the non-existent, only at the time that there is the cognition of the existent. When the lamp illumines and renders visible something that is visible, that which is not seen in the same manner as that visible thing is regarded as non-existent, the mental process being as follows: 'If the thing existed, it would be seen: since it is not seen, it must be concluded that it does not exist'. According to Vaisesikas, "As the appearance of the effect is indicative of the existence of the cause, so is the appearance of the effect indicative of the non-existence of the cause."

(e) Chesta (Gesture)

According to Tantrikas, chesta is also a source of new knowledge. For example, we know that a dumb fellow is hungry by the gestures that he makes. We also come to know the thoughts and feelings of other people by their gestures and postures. The Naiyayikas regard it a kind of inference in which a sign gives us a knowledge of something else signified by it.

(f) Parisesa (Elimination)

Parisesa is the process of knowing something by eliminating from a group of things those which it is not. But the Naiyayikas do not regard it as an independent source of knowledge and include it under sesavat inference.

(g) Memory (Smrti)

The Jainas and the Vaisesikas accept memory as a source of valid knowledge. According to them, memory is not merely a revival of the impressions of past experience i.e., it is the knowledge of a previously experienced object as past. Kanada supports the idea when he defines memory as "due to a peculiar contact of the soul with the manas and the trace left by the previous experience."

The Nyaya school does not admit memory as a separate source of knowledge, since we have in it not any cognitive knowledge of objects, but only a reproduction of a past experience in the same form and order in which it once existed in the past and has now ceased to exist. The validity of remembered knowledge depends on that of the previous experience which is reproduced. It does not correspond to given objects and does not arise out of the objects themselves (arthajanya). Memory, being thus based on no given datum (anarthajanya), fails to give valid presentational knowledge (prama), and so, is not a source of knowledge (pramana).[63] According to Gautama and Vatsyayana, recollections are not simultaneous, since attention (pranidhana), perception of the sign and the rest (lingadijnana) are not present at one and the same time. Hence, memory cannot be given a status of an independent source of knowledge.

(h) Recognition (Pratyabhijna)

The Jainas take pratyabhijna to mean recognition in the sense of both understanding and nature of an object and knowing that it was perceived before.

But according to the Naiyayikas, recognition consists in knowing that a thing now perceived is the same as what was perceived before. Thus it gives us the knowledge of an object as existing in the present and as qualified by its relation to the past.[64] A thing's relation to past time or a past experience is a character which qualifies its present existence. To know this is just to know that what we have perceived it before, i.e., to recognize it. Hence, recognition is a special mode of savikalpaka perception. In an ordinary savikalpaka perception the representative factors do not remain distinct but are assimilated with the representative elements to make up one precept. In recognition, the representative factor has the form of a definite recollection of some past experience of an object and modifies the present perception of it. Still it is perception, since it is brought about by sense-object-contact.[65] Hence the Naiyayikas conclude that recognition is a kind of qualified perception in which the present object is qualified by a distinct recollection of its past experience.

Thus, we have rejected, from the Nyaya point of view, all the above-mentioned means of knowledge and established that for the Naiyayikas there are only four distinct and independent sources of knowledge. Being a realistic school, the Nyaya epistemology has a great value for the common-sense stand-point. We often hear that the theories of Indian philosophy are not based on reasoning but on religious authority and, therefore, they are dogmatic rather than critical. But the Nyaya philosophy is a standing repudiation of this charge. Nyaya applies the method of logical criticism to solve the problem of life and reality. The different kinds of inference and fallacies recognized by the Nyaya have become common-place in Indian philosophy. By its sound logic, Nyaya tries to ascertain the truth of the objects which ultimately leads to our highest end. These means of knowledge have been in use in the modern times. All branches of knowledge—Basic Sciences, Applied Sciences, and Social Sciences—are making use of these means of knowledge.

Dhirender Mohan Dutta observes that of course, it is true that only the words of a reliable person (apta) can yield valid knowledge. But similarly only undisturbed perception and unvitiated inference can yield valid knowledge. In other words, the possibility of doubt and error is common to all sources of knowledge; and this should not prevent us from admitting authority as a source of knowledge. If we disbelieve authority, we have to go without so much of valuable knowledge obtainable from the statements of specialists, experts, and the scriptures. The Mimamsa school tries to show in this connection that if we do not accept the authority of the Vedas, we have no other means of knowledge by which we can ascertain which ritual has to be performed for which purpose and with what result. The Vedas are the only source of knowledge of the various injunctions (dharmas).[66]

CONCLUSION

Prof. Murli Manohar Joshi beautifully observers:

A significant aspect of Indian epistemology which distinguishes it from the dominant western discourse is the inseparable link between epistemology and ontology and of both with ethics. Knowledge and moral perfection are regarded as complementary to each other in almost all systems of Indian thought. Sometimes knowledge is regarded as the means to the good life, sometimes again moral purity is indispensable for perfect knowledge so that morality and language are regarded as two inseparable aspects of perfection. The second distinguishing characteristic is the absence of binary approaches to the attainment of knowledge, whereby no dichotomy is seen between the empirical, rational and analytical modes of knowing and the mystical and intuitive modes. In fact, both modes of knowing reinforce and sharpen each other.

In the context of these distinguishing features, consider for a moment this plea from an avowedly rationalist Scientist—Paul Davies: Observes:

"But in the end a rational explanation for the world in the sense of a closed and complete system of logical truths is almost certainly impossible. We are barred from ultimate knowledge, from ultimate explanation, by the very rules of reasoning that prompt us to seek such an explanation in the first place. If we wish to progress beyond, we have to embrace a different concept of 'understanding' from that of rational explanation. Possibly the mystical path is a way to such an understanding."

If we now return to using an epistemology which was never premised on the dichotomy between the rational and the mystical, or the rational and the moral, we have an opportunity to develop a science which can be intellectually rigorous and elegant, ethically sound and emotionally satisfying.

The development of modern science as a timeless, socially autonomous, value neutral field of enquiry and the social acceptance of this autonomy and neutrality has led to a civilizational crisis. Science has proceeded on the assumption that pursuit of science and of technology is a value in itself and cannot be subjected to the social and ethical codes applicable to the rest of humankind. Thus, in the name of scientific progress, it justifies development of weapons of mass destruction, rapacious consumption of energy and materials oblivious to the consequential devastation of the environment, appropriation of traditional community owned knowledge to achieve intellectual property rights by individuals and firms. Should we continue to accept this situation as justified in the interests of science?

The restoration of the centrality of ethical and moral issues to the development of science and technology is in my view the most important task for social scientists today. Science needs a paradigm shift to build in ethics as an integral part of the standards of what constitutes 'good' science. In bringing about this paradigm shift social scientists have to engage in a deep and meaningful dialogue with scientists, at the level of philosophy and epistemology as well as at the level of methods and practice. This can only happen through a collective, democratic effort at a churning of ideas wide open minds and a Kierkegardian 'passion' for creativity.

Dr. V.R. Panchamukhi in his theme paper, "New Frontiers of Knowledge and Connectivity among Civilization: Social Sciences and Humanities" clearly defines that it is a regrettable fact that much of the socio-economic thoughts and paradigms in our societies are often prompted by the development of the literature in the 'alien' societies which do not possess any similarities to our own socio-economic and cultural systems. Much of the damage to the development processes of the different countries is caused by the blind following of the 'alien' thoughts and prescriptions, without subjecting them to the rigorous tests of relevance to our societies. Many of the indigenous thought processes and perceptions are discredited and discounted in the midst of our excessive 'love' for the external thoughts. Such societies experience some kind of 'intellectual servitude' and 'cultural identity crisis', 'monopoly' in thoughts for goods and services. New approaches for encouraging indigenous thoughts and perceptions, and for fostering socio-economic research in an independent framework, need to be identified and encouraged.

We regrettably find that the world community is fast getting pushed into a deep raven devoid of the well cherished values and traditions of the different cultures. Apart from the dangers of losing cultural identities, the emerging tendencies of human behaviour are destroying even the long proven advantages of the pluralistic societies prevailing in some parts of the world. There seems to be growing confusion between the systems of 'cultural Pluralism' and 'Multi-Culturalism'. While the former implies harmonious coexistence of diverse cultures, with suitable *inter-se* assimilation of diverse cultural traits and with the evolution of an environment of mutual respect and acceptance, the latter signifies mere physical existence of people of different cultural background in a particular region or a nation. While 'Cultural Pluralism' has proved to be a source of strength for 'Development' of a nation, 'Multi-Cultural' framework without the processes of *inter-se* assimilation, could be the source for conflict and impediment for development. The world community should appreciate the merits of 'Cultural Pluralism' as a symbol of civilizational and cultural maturity of the respective society and facilitate sustenance of such culturally pluralistic societies instead of trying to sow the seeds of discordance in such societies.

Today the mankind is facing a situation of acute 'Values Crisis'. We need to take urgent steps to resurrect the much cherished spiritual and Cultural Values of life, such as Caring for others, Restraint on self-consumption for the welfare of the masses, the attitude of Sharing with others the benefits of technological and other types of progress, the attitude of contentment and simple life style, National pride, pride for one's own Heritage and culture, etc. the newly emerging framework of 'Knowledge Societies' should set out an environment of free and fair exchanges of ideas and perceptions among the 'strong' and the 'weak' 'cultural societies', instead of forcing a universal harmonization towards only one type of 'knowledge and cultural system', by using different types of power such as 'money power', 'information and communication power', and even 'military power'. Simultaneous blossoming of the diverse 'Knowledge Systems' and their *inter-se* 'Dialogue and Communication' have always proven to be conducive to the process of explosive expansion of 'Knowledge' and the consequent improvement of the welfare of the mankind. It may be noted that in all civilizations and cultures, in the past, 'knowledge' has always remained as a public good of merit rather than being a 'Market good', of mere commercial value. The future of mankind would be in grave dangers of self-annihilation, if 'knowledge' continues to be fostered as a purely commercial good that can be possessed only by those who can afford it.

Radhakrishnan's epistemological study is nothing but an exploration into the possible sources of knowledge. He considers this problem to be very important, firstly, because this problem is traditionally important, second, because every system of meta-physics is based on an epistemology outlining the sources of knowledge and thirdly, because Radhakrishnan's metaphysical convictions demand a faith in a particular source of knowledge—a source whose relative strength in relation to other possible sources of knowledge has to be determined. Radhakrishnan is aware that the East generally emphasizes the ultimacy of creative Intuition and that the West lays emphasis on critical Intelligence. He tries to examine the relative merits of the two faculties.

According to him there are three possible sources of knowledge: sense-experience, Intellectual cognition, and Intuitive Apprehension. (See Chart 2.5)

Sense-experience is the source through which we know the sensible qualities of the object. Radhakrishnan's 'Sense-experience' is nothing different from what Psychology describes as sense perceiving. Its function is to gather impressions of the physical objects—both outer and inner and to provide materials for every kind of study and thought.

Intellectual cognition, on the other hand, is almost the same as Conceptual knowledge. It is knowledge obtained by a process of analysis and synthesis. The data supplied by the senses are analysed by the intellect and a new synthesis is perceived. This knowledge is not only indirect but also symbolic. It is indirect because its contact with the object is not a direct contact; it deals only with that which is given by sensibility. From the senses it receives only certain representations of the objects; that is say, it receives merely signs and symbols; and hence it is symbolic.

Radhakrishnan feels that sense-experience or Intellectual Cognition cannot give the knowledge of reality, although in practical life they are useful as source of knowledge. He thinks that both of them are inherently limited, and in a sense, even defective. As such they are incapable of comprehending the reality.

Giving a very vivid description of the nature of Intuition Radhakrishnan says, "Intuition is only the higher stage of intelligence, intelligence rids of its separative and discursive tendencies. While it liberates from the prejudices of the understanding, it carries our intellectual conclusions to a deeper synthesis. Instead of being an unnatural and mysterious process, it is a deeper experience, which by supplementing our narrow intellectual visions, amplifies it. Intuition is not an appeal to the subjective whims of the individual, or a dogmatic faculty of consciene or the uncritical morbid view of the psychopath. It is most complete experience we can possibly have. It is the experience which devout souls have in moments of spiritual exaltation or religious devotion.[67]

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44. S.C. Vidyabhusana, History of Indian Logic, p. 520, Appendix B.
45. A.B. Dhruya, Introduction of Nyaya-Pravesa of Dignaga'.
46. Madhavacarya Sarvadarsana Samgraha, Ch. II.
47. *Ibid.*, Dharamkriti, Nyaya Bindu, Ch. II.
48. Uddyotakara, Nyaya Vartika, pp. 158-64.
49. Visvanatha, Bhasa Pariccheda with Siddhanta Muktavali, p. 137.
50. *Ibid.*
51. *Ibid.*, p. 138, Madhavacarya, Sarvadarsana Samgraha, Ch. I.
52. Gautama, Nyaya Sutra, 1.1.6.
53. Varadaraja, Tarkikaraksa, p. 86.
54. Annam Bhatta, Tarka-Samgraha Dipika, p. 63.
55. Gautama, Nyaya-Sutra, 1.17.
56. Vatsyayana, Nyaya-Bhasya, 1.1.7.
57. Annam Bhatta, Tarkasamgraha, p. 73.
58. Madhavacarya, Sarvadarsana Samgraha, Ch. I.
59. Vatsyayana, Nyaya Bhasya, w.q. 50-55.
60. Vatsyayana, Nyaya-Bhasya, 2.2.1.
61. *Ibid.*
62. *Ibid.*
63. Jayanata, Nyaya-Manjari, pp. 20-23.
64. Jayananta Nayaya-Manjari, p. 459.
65. *Ibid.*, p. 461.
66. Dhirendra Mohan Datta, *op. cit.*, pp. 550-51.
67. Radhakrishnan, Reign of Religion in Contemporary Philosophy, p. 439.

CHAPTER 3

THEORY OF CAUSATION: CAUSE AND EFFECT

> There is an absolute difference between a cause and its effect, and there is entirely a new and fresh production. But, in spite of this, both are mutually bound together by a mysterious tie of relation, so that as long as the effect lasts it inheres in its cause, and even when it does not exist, as for instance, before its production and afte r its destruction, its non-existence, in both states, technically called pragabhava and dhvamasabhava, is also attributed to the same cause. Kanada's is the first attempt to explore a relation between casue and effect. The evolution and development of science is also based on the implicit faith in the law of causation, as the scientific study means the search of a cause or a number of causes leading to a particular phenomenon.
>
> —*Author*

3
CHAPTER

Theory of Causation: Cause and Effect

(See Charts 3.1 and 3.2)

Gray Zukav and Hinda Francis in their book, "The Mind of the Soul" rightly advocate that most people think of cause and effect only in scientific terms. In fact, science is the exploration of causes and effects, but only physical causes and physical effects. No one could imagine all the possible physical effects of all physical causes, nor is it necessary, because scientists can use what Isaac Newton—one of the most famous founders of science—called the "laws of motion" to predict the physical effects of physical causes, and also produce physical effects by creating their causes. In other words, a cause and its effect are not separate.

What about phenomena that do not have physical causes or do not produce physical effects/they are excluded from science. For example, love, reverence, hate, jealousy, contentment, gratitude, and joy are excluded, as are your hunches, insights, the experience of meaning, and the content of your thoughts. None-the-less, all of these have effects. Consider, for example, acts of kindness.

Science has contributed many grand and important things, from pharmaceuticals to space probes, but it is not designed to explore the things that are most valuable and worthy of your exploration. For example, no scientist can describe scientifically why he is excited about science.

Newton created the laws of motion about three hundred years ago, but science is a product of something much older—the exploration of the physical world with the five senses. Long before Newton discovered the laws of motion, early humans learned to use stones to pound, sticks to dig, and gourds to carry water, and with tools such as these they created shelter, clothing, agriculture, and, eventually, science.

Now the exploration of physical reality can no longer help us to

CHART 3.1

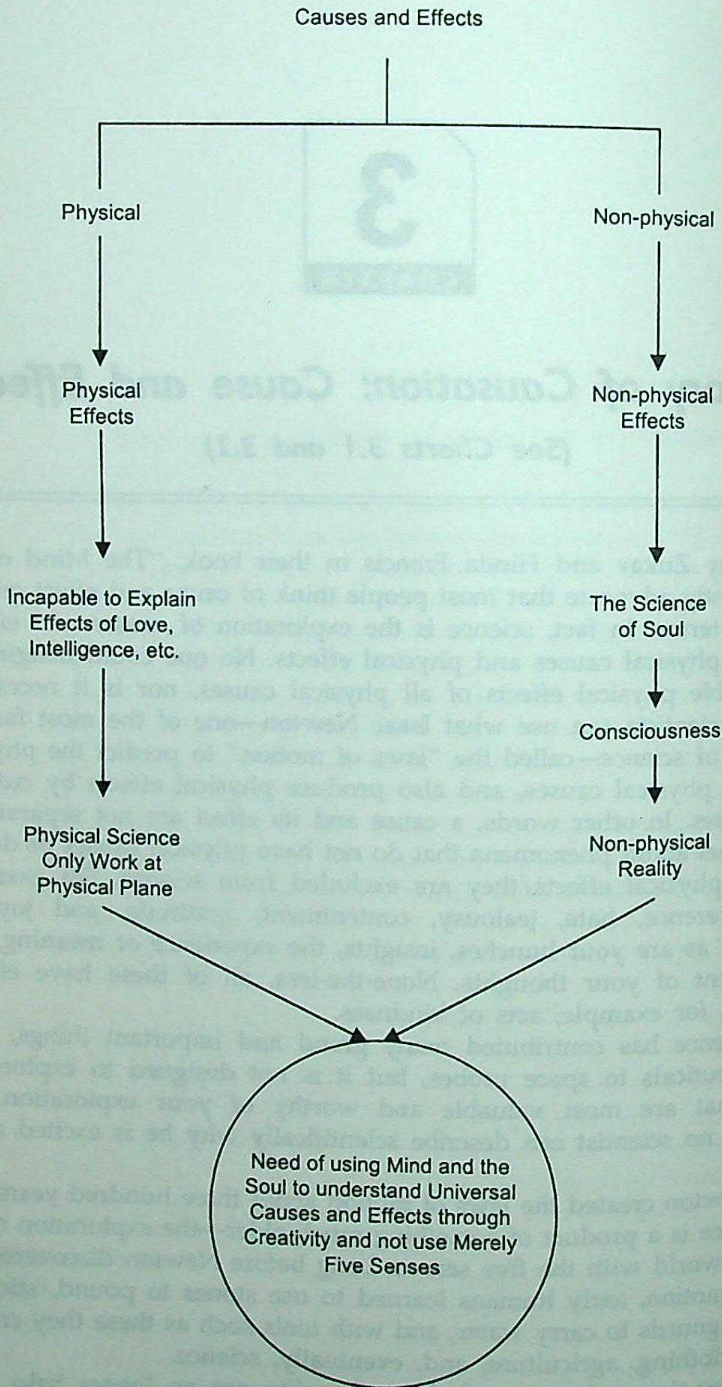
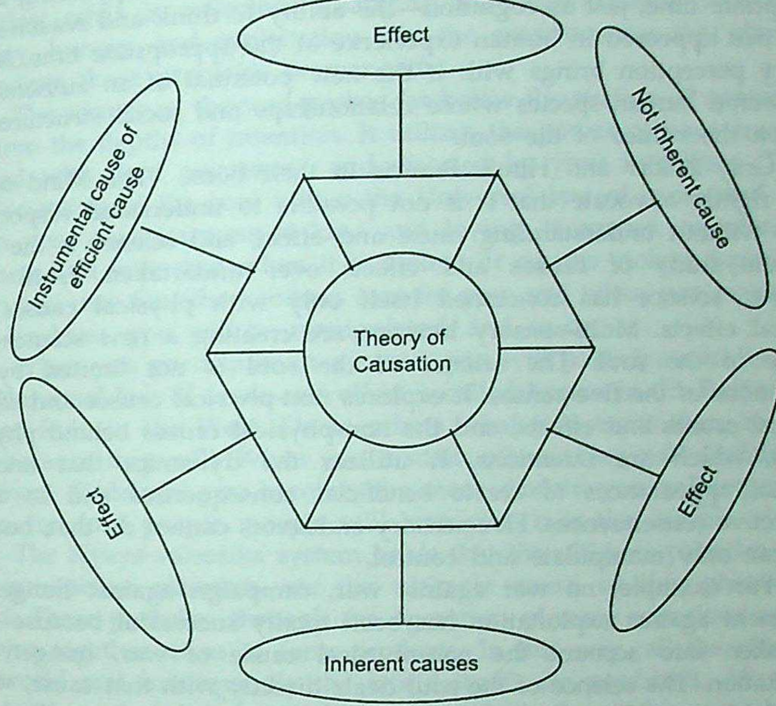

Causes and Effects
Physical
Non-physical
Physical Effects
Non-physical Effects
Incapable to Explain Effects of Love, Intelligence, etc.
The Science of Soul
Consciousness
Physical Science Only Work at Physical Plane
Non-physical Reality
Need of using Mind and the Soul to understand Universal Causes and Effects through Creativity and not use Merely Five Senses

CHART 3.2



evolve, or even to survive. Our experience is expanding beyond the limitations of the five senses, and we are becoming aware of non-physical reality—intelligence, compassion, and wisdom that is real but not physical. We are also beginning to see the dynamics that underlie physical appearance, and as we do, we are becoming more interested in them than the appearances they produce.

The goal of five-sensory humans is to survive, which they have done by developing the ability to manipulate and control external things. That is external power. Multi-sensory humans are not satisfied with controlling more or having more. Their goal is spiritual growth, and they understand power in a new way—the alignment of the personality with the soul. That is authentic power.

Multi-sensory humans evolve by creating authentic power. They know the Universe is not a dead or random arena in which Life happens accidentally, and they explore non-physical causes and effects in addition to physical ones. Millions of humans are now realizing that they are more than enzymes and molecules, and more than bodies and minds. They are becoming aware of themselves as souls, yet the five senses cannot detect the soul. In other words, humans no longer need to believe that they have souls because they are beginning to experience themselves as souls.

Multi-sensory perception is emerging in every culture and race and at every age level. It is a gift from the Universe that is appearing at the appropriate time, just as cognition—the ability to think and reason—was a gift that appeared in human experience at the appropriate time. Multi-sensory perception brings with it the new potential of an authentically empowered human species whose relationships and social structures are built on the values of the soul.

Gray Zukav and Hinde Francis in their book, "The Mind of the Soul" rightly advocate that it is not possible to understand responsible choice without understanding cause and effect, and science is the most complete study of causes and effects ever undertaken. Until now, however, science has concerned itself only with physical causes and physical effects. Multi-sensory humans are creating a new science—the science of the soul. The science of the soul is not limited by the perceptions of the five senses. It explores non-physical causes and effects, physical causes and effects, and the non-physical causes behind physical causes, which are intentions. It utilizes the dynamics that underlie physical appearances to create beneficial consequences and to avoid destructive consequences. Five-sensory endeavors cannot do that, because they can only manipulate and control.

For example, no war against war, campaign against hunger, or movement against exploitation has been totally successful because none has taken into account the non-physical cause of war, hunger, and exploitation. The science of the soul deals directly with that cause, which is consciousness. The science of the soul investigates how to pull up the roots of war, hunger, exploitation, and all painful and destructive experiences permanently.

Five-sensory scientists think that physical reality shapes consciousness. Scientists of the soul see that consciousness shapes physical reality. The science of the five senses ends with understanding the relationships between physical causes and physical effects, while the science of the soul begins there and goes much deeper. It explores the larger arena of non-physical reality.

A five sensory scientist experiments in a laboratory by creating physical causes and observing physical effects. Scientists of the soul use their live as their laboratories. They prepare non-physical causes—choose their intentions—and observe the effects. You can become a scientist of the soul, also.

First, before you act or speak, become aware of your intentions. Second, consider the probable consequences of each of your intentions. Third, choose the intention that will create the consequence you desire. (That is a responsible choice.) Fourth, observe how your experiences change. If your experiences do not change, look for parts of your personality that hold different intentions, and change them when you find them. Then do the experiment again. That is the new scientific method.

Scientists of the soul change the reflection they see around them by changing what is reflected. Changing the consciousness that creates poverty, hunger, and exploitation into the consciousness that cherishes. Life solves those problems permanently.

The science of the soul probes far below the surface of appearances and into the depths of intention. It utilizes the power of your creativity, applied with your awareness, and directed by your intentions. That is how scientists of the soul utilize the Universal law of cause and effect. When your consciousness is kind and loving, it creates experiences of kindness and love, and when it is violent, it creates violent experiences. When you care for others, others care for you, and when you manipulate with kindness, you will be manipulated, and so on.

When you participate in a cause, you will participate in its effect. The Universal law of cause and effect is called Karma in the East and the Golden Rule in the West. Do to others what you want them to do to you, because they will. When you disdain others, they will disdain you. The more disdainful you become, the more disdain you will experience. When you love people, people will love you. It is that simple.

The Nyaya-vaisesika system holds that the ultimate particles of the four productive elements are the ultimate cause of this phenomenal world. These particles, through the operation of some conscious agency, combine together so as to form products. In this way, all the effects of this world and consequently the world itself, are produced. All this is due to the principle of causality upon which the entire metaphysical system of Nyaya-vaisesika realism has been structured. The question arises: what is the principle of causality/By the principle of causality we mean that every event has a cause. In other words, whatever happens is made to happen by a cause. This is the common view of all the systems of Indian philosophy. According to all orthodox systems, the belief in causation is almost an instinct with the human mind. Without it all practical activity would become impossible. But there are different views among the different systems upon some points like: Is the effect merely the manifestation of that which existed before, or is a real and fresh production/is the effect absolutely identical with the cause, or is different from it/these questions are upheld by the four important theories of causation which figure prominently in Indian philosophy, viz., (1) the modification theory of the Samkhya (parinamavada); (2) the theory of unreal or apparent production of the Advaita-Vedanta (vivartavada); (3) the theory of dependent origination (pratitya samutpatvada) of the Buddhists; and (4) the theory of emergent production (arambhavada) or the theory of non-existence of effect in 'cause' (asatkaryavada) of the Nyaya-vaisesika.

Samkhya Theory of Parinamavada

The Samkhya view is succinctly put in the famous words of Gita (2.16): "there can be no existence of the non-existence and no non-existence of the existent." According to Samkhya, an effect is not a new entity; it is already contained in its cause in an unmanifested state, and the production of an effect means merely its manifestation. Since an effect exists in its cause in an unmanifested state even before its appearance, it is said to be ever-existent (sat), and hence the Samkhya theory of causation is known as Satkaryavada (the theory of ever-existent effect). The manifestation of an effect is brought about by a change in the cause, and as this change is conceived as a real change, the causal theory of the Samkhya system is called Parinamavada or Vikarvada, i.e., the theory of change, transformation or evolution from the cause. According to the Samkhya school, there is an abiding substance which runs through the causal series. For example, when a gold vessel is broken and changed into a different form, the change occurs only in the arrangement of gold, but not in the substance, i.e., gold.[1] Production means the modification of the form of the causal stuff. The fundamental stuff which runs through the causal series is neither produced nor destroyed. It is eternal. Thus, according to Samkhya, the dharmin (dravya) does not change; only the dharmas (bhavas) change. The two, however, are identical. Samkhya system holds that if it were not so, anything could arise out of anything. In that case, nobody would make any selection of a particular material for the production of a particular effect. Moreover, causal capacity to bring about a certain effect belongs to certain things only, and they are those things which possess a potency necessary for the production of the effect.[2] From these considerations, the Samkhya philosophy comes to a conclusion that all the effects that come into manifestation after the fulfilment of the necessary conditions have a previous existence in potential form. The world process does not bring anything new. It is a process of transformation of the potential (avyakta) effects into actual (vyakta) effects. The whole world of the manifold objects, except the Individual soul, is the modification of the primordial matter, the 'prakrti'.

Vedanta Theory of Vivartavada

According to this theory, there is no real production because it holds that the essence of an effect is identical with the essence of its cause. The difference between cause and effect is not the difference between two basically different entities but the difference between the two forms of the identical stuff. This theory holds that in a causal process, the form of a cause is changed into a new form without involving any change in the essence of the causal stuff. Now, unless there is change in the essence of the causal stuff, there cannot be any real change even in the form of that stuff. The Advaitins, therefore, hold that what is regarded as the real modification of the causal stuff is only an appearance. There is no real change in the abiding eternal substance, the 'Brahman'. The manifold world of different forms and names is not the result or the real modification of Brahman but only an appearance generated by the beginning less 'avidya.' Thus, the 'Parinamavada' of

Samkhya logically leads to the Vivartavada of Sanker, according to which there is no real production.

Buddhist Theory of Pratitiya Samutpatvada

According to the Buddhist theory of causation, a cause is completely annihilated without leaving anything behind it and the effect arises after the annihilation of the cause. Thus, according to the Buddhist theory of causation, the relation between what is regarded as cause and what is regarded as its effect is nothing but the relation of antecedent to any consequent. The Buddhists hold that a cause is an invariable antecedent of its effect and the former is absolutely different from the latter. The carvakas objection against their theory is that two absolutely different entities cannot be regarded as related by the causal relation. To hold that a thing is produced from an absolutely different thing amounts to hold that it is produced out of nothing. It is produced out of nothing, then the thing which invariably precedes it has no causal relation to it. It then arises of its own accord, without depending upon anything else. The Buddhist contention that in the objectively real world the occurrence of one moment means the death of the preceding moment, would not object to the Carvaka's position which holds that a thing is produced out of nothing.

Nyaya-vaisesika Theory of Asatkaryavada or Arambhavada

The Nyaya-vaisesika, a system pledged to realism, advances a theory opposed to the Samkhya system. Theory of causation of a system is based on the relation conceived in that system between dharma and dharmin. As we know the basic principle of the Nyaya-vaisesika metaphysics is the theory of dharma-dharmi-bheda, i.e., the differentiation is essence between the substrate and their properties. Hence, to save the reality of the external world this system holds that there is an absolute difference between a cause and its effect. A cloth in order to be real must have an essence different from that of the threads. This is the reason why the Nyaya-vaisesika adopts the theory of asatkaryavada (origination of the non-existent effect).[3] The position of the joint-system as formulated by Vacaspati Misra is . . . satah asaj jayate, i.e., from the exist (cause) comes into being an effect which was non-existent before.

The empirical view of the theory of causation of Nyaya-vaisesika system stands out very clearly in the definition of cause and effect. Cause has been defined by Udayana as an invariable antecedent of an effect. He also regards it as its unconditional or necessary antecedent. If an unconditional antecedent, which is always present when an effect is present and which is always absent when an effect is absent, were not regarded as its cause, then the effect would be uncaused.

From the above mentioned definition of a cause, we would say that the first essential characteristic of a cause is its antecedence; the fact that it should precede the effect (purvavrtti). The second is its invariability; it must invariably precede the effect (niyatapurvavrtti). It must invariably precede the effect (niyatapurvavrtti). The third is its unconditionality or necessity; it must unconditionally precede the effect (ananyathasiddha). Unconditional antecedence is immediate and direct antecedence and excludes the fallacy of remote cause.

Nyaya definition of a cause is the same as that in Western inductive logic. Hume defines a cause as an invariable antecedent. J.S. Mill defines it as an unconditional and invariable antecedent. Carveth Read points out that unconditionality includes immediacy. A cause, therefore, is an unconditional, immediate and invariable antecedent of an effect.

An effect is the unconditional, invariable consequent of a cause. It is defined as the 'counter-entity of its own prior non-existence' (pragabhava-pratiyogi).[4] It is the negation of its own prior negation. It comes into being and destroys its prior non-existence. It was non-existent before its production. It did not pre-exist in its cause. It is a fresh beginning, a new creation. This Nyaya-vaisesika view of causation is directly opposed to the Samkhya theory of Satkaryavada. The Nyaya-vaisesika system is the champion of realism. In order to uphold the reality of the manifold world of experience, it maintains that production does not mean the change in the form of the causal stuff, but the emergence (arambha) of a new entity which is completely non-existent (asat) in the cause. An effect is a real entity completely different from its cause. It is not identical with the cause. Between the new effect and its inherent cause there is an absolute difference (atyantabheda). It is neither an appearance nor a transformation of the cause. It is newly brought into existence by the operation of the cause.

As to the relation of cause to its effect, two different theories have taken shape in the course of the history of the Nyaya-vaisesika. These two theories are called the earlier and later theories. The theory of causation which is propounded in the Nyaya-sutra and in the Nyaya-bhasya is not the same as the theory of causation discussed in the manuals of the syncretic school. The theory of causation which is discussed in the manuals of the syncretic school crystallized in Nyaya-kandli and Kirnavali, though the beginning of this theory is made in the Nyaya-vartika-tatparyatika.[5]

While according to the earlier theory a cause is destroyed at the moment of the origin of the effect, according to the later theory the cause continues to exist along with the effect. According to the later theory, the effect resides in the cause by the relation of 'samavaya'. Though the concept of the 'avayavin' is discussed and defined in the Nyaya-sutra and Nyaya-bhasya, yet the simultaneous existence of effect and cause is not accepted therein. Gautama says, "As an effect-substance is produced only when the cause-substance is disjoined, it is inferred that the cause is destroyed prior to the production of the effect."

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According to the earlier theory both the cause-substance and the effect-substance are 'wholes' (avayavins). In a causal process the cause-substance which is an 'avayavin' residing in its parts is destroyed leaving behind it its parts in which another 'avayavin' the effect-substance is born. The cause substance is different from the effect-substance. The latter arises when the first is destroyed.

Though, according to this theory, the cause is destroyed before the emergence of the effect, yet it accepts some sort of bond between the cause and the effect through the identity of their parts. The parts left over by the destruction of the cause-substance the 'avayavin', carry, as if, the essence of the cause to the effect. This theory, thus, avoids the position of holding that an effect arises from void. Vatsyayana says, "When an old 'avayavin' (cause) is destroyed by disjoining the arrangement of its parts, and the parts are re-arranged, a new 'avayavin' or substance (dravya) is born in them, the new born substance is not born out of nothing." According to this theory the parts are not regarded as separate substances.

According to the later nyaya-vaisesika theory of causation, there is no destruction of the cause prior to the emergence of the effect. The cause continues to exist even after its effect is produced. According to this, cause is not thought to be 'an avayavin' residing in some parts but the parts themselves. While according to the earlier theory the whole and the parts together constitute one substance, according to the later theory they constitute two different substances. The later theory holds that the parts form the cause and they continue to exist along with the emergent effect. It is to be noted that though, according to the later theory, the cause continues to exist even after the effect is produced, yet there is no internal relation between the cause and the effect. The cause and the effect, the parts and the whole, are two different substances which are related by an external relation known as 'samavaya'.

According to the later as well as earlier nyaya-vaisesika theory of causation, an effect is entirely non-existent in its cause. But while the earlier theory holds that the parts of a cause-substance are identical with the parts of the effect-substance, according to the later theory there is nothing common between a cause and an effect. The parts which form the cause are different from the effect substance.

According to the Nyaya-vaisesika, an effect is never produced out of its cause. The cause is a substance which does not transmit its essence to the effect. Though the effect has nothing in common with the cause, yet the former can reside only in the latter. The effect arises in the cause and resides therein by the relation of inherence (samavaya) which itself is an entity and thus, while it relates the effect to the cause, it also serves as a wedge and does not let the one merge into the other.

It should be noted that while according to the Samkhya, there is identity of the fundamental stuff of cause and effect, according to the later Nyaya-vaisesika theory there is not internal relation between cause and effect, no transference of an essence from the cause to the effect. The earlier Nyaya-vaisesika theory of causation holds the middle position between the Samkhya theory and the later Nyaya-vaisesika theory. It differs from the Samkhya theory in holding that the cause-substance is different from the effect-substance. But there is agreement between them in so far as they hold that the destruction of a cause is not its complete annihilation.

According to the earlier Nyaya-vaisesika theory of causation, a cause is an 'avayavin' and its destruction means the destruction of cause as an 'avayavin' only. When a cause is destroyed, it is not completely annihilated but it leaves behind it its parts which are rearranged and thus, the effect, a new 'avayavin', a different substance, is born therein. The main difference between the Samkhya theory and the early theory of Nyaya is that while according to the latter the whole residing in the parts is a new substance, a new entity, according to the former it is simply the new form of the abiding stuff.

Samkhya doctrine of satkaryavada has been criticized by the Nyaya-vaisesika system as this joint-system takes its stand upon the actual experience of the common people. According to it, an effect is non-existent before its production, since it is found to be produced and then destroyed. What is produced must be non-existent before its production. If there is no production, there is no destruction.[6] The samkhya argues that if there were no permanent relation between a cause and an effect, any effect would be produced by any material cause. There can be no relation between an existent cause and a non-existent before its production and becomes existent after its production, so that it can inhere in its material cause when it is produced. The Samkhya doctrine of satkaryavada itself cannot account for particular effects being produced by particular material causes. If all effects are modifications of sattva, rajas and tamas, there can be no particular causes of particular effects.[7] The Nyaya-vaisesika system holds that particular material causes only can produce particular effects owing to their particular natures. Satkaryavada denies production of a new entity and destruction of an old entity, and so leads to collapse of all practical life.[8] The Samkhya holds that an effect pre-exists in its material cause in a potential condition, and is manifested when it is produced. What is the nature of manifestation (abhivyakti)? If it is a property of an effect (karyadharma), then it was non-existent before its production. If it is perception of an effect (upalabdhi), then it is produced after the effect is produced. If it is in existence as an effect of what was existent as a cause, then it was non-existent before its production. If it is a particular arrangement of parts, then it was non-existent at first and then becomes existent. If it is development of the intrinsic nature of the cause, then also it did not exist before production of an effect. All these alternatives undermine satkaryavada, and imply asatkaryavada.[9] The Samkhya argues that an effect must pre-exist in its cause because it is non-different from its material cause. The Nyaya-vaisesika replied that an effect (e.g., a jar) is perceived to be different from its cause (e.g., clay). Both the clay and the pot do not serve the self-same purpose, which shows that there is a real difference between them. Though there is identity of genus between them, they are different as individuals.[10] Similarly, the notion of the cause is different from that of the effect. The vyapadeca (naming) also supports the Nyaya viewpoint. Never the term 'effect' is used for the term 'cause', and also *vice-versa*. Their functions, which are pre-determined, also help the theory of asatkaryavada. Hence, the doctrine of satkaryavada is not tenable.

Classification of Causes

The Nyaya-vaisesika system distinguishes three kinds of causes, viz., (i) samavayikarana (inherent cause), (ii) asamavayikarana (non-inherent cause), and (iii) nimittakarana (instrumental cause or efficient cause).

(i) Samavayikarana is defined as that in which the effect abides by the relation of inherence (samavaya).[11] It is productive of the effect in the sense that the effect cannot come into being except as inhering in it. The effect is so intimately connected or indentical with the samavayikarana that it cannot be separated from the cause without losing its own existence. It is that common factor between the cause and the effect which is identical or substantially the same in both of them. The yarns are the inherent cause of the cloth since, as components (avayava) of the cloth, they are not only responsible for its production but also constitute the substratum in which it subsists by inherence.

The inherent cause is necessarily a substance, for an effect can inhere in substance alone.[12] The inherent cause may have for its effect a substance, or a quality, or an action. The yarns, for instance, are held to be the inherent cause not only of the cloth that is made out of them but also of their own colour and of their dropping down from the hand of a careless weaver.

The principal cause (e.g., yarn) is not conceived by the Nyaya-vaisesika school as material cause or upadana-karana (as it is by the Samkhya school), but as inherent cause (samavayikarana). According to Nyaya-vaisesika school, an inherent cause is always in the form of 'parts' (avayavas), while an effect is in the form of a 'whole (avayavin). The Nyaya-vaisesika school maintains against the Buddhist that a 'whole' is not merely an aggregate of its parts, but an altogether new entity quite distinct from its parts. A 'whole' (avayavin) emerges as residing in its parts by inherent relation (samavaya sambandha). This means that an effect is different in essence from its cause in which it resides by inherent relation as a separate entity. Cause and effect are not conceived by the Samkhya as different entities; they are identical. A piece of cloth, according to the Samkhya, is only a different arrangement of threads. The thread imparts essence to the cloth, or more exactly, the essence of both is the same. According to Nyaya-vaisesika school, however, the inherent cause, which exists simultaneously and side by side with its effect and as such retains its full essence to itself cannot, in any way, impact essence to its effect. An inherent cause is thus not a material cause. In Nyaya-vaisesika school, the inherent cause (e.g., yarn) is as extraneous to its effect, as the accessory causes (nimitta-karanas) like loom, shuttle, etc. Uddyotakara clearly suggests that an inherent cause is not a material cause, but is extraneous like the accessory causes. He says: "yarn is an entity quite different from cloth, because it is the cause of the latter like the shuttle, etc. As the shuttle, etc., which are the cause of cloth, are different from it, similarly, the yarn also (which is a cause) is different from cloth."[13]

(ii) Asamavayikarana or non-inherent cause is that which produces its effect by being intimately connected with the inherent cause of that effect. For example, the conjunction of the threads, which inheres in the threads, is the non-inherent cause of the cloth. It inheres in the threads and not in the cloth, threads being its inherent cause. Hence, it is the non-inherent cause. Similarly, the colour of the threads is non-inherent cause of the colour of the cloth, for although it contributes to the production of the colour of the cloth and hence is a cause of it, it inheres in the threads and not in the colour of the cloth.14 The non-inherent cause is always a quality or an action, while the inherent cause is a substance.[15]

The admission of the non-inherent cause is a special feature of the Nyaya-vaisesika system which explains every case of production of a substance as a case of fresh combination of parts forming a new whole. It is not enough that the yarns should merely exist, they are also required to be conjoined in a definite order, because they have little significance when taken by themselves, apart from their participation in the whole. They can participate in the whole only through being joined together, i.e., through the mediation of what is called the non-inherent cause. Thus, the non-inherent cause appears to be an extremely necessary factor with a peculiar position and function in the process of causation. It is intimately bound up with the inherent cause, but at the same time it sustains the product and determines its distinctive form and character.

Non-inherent cause is not recognized in other systems of Indian philosophy as distinct from the inherent cause. Both the inherent and the non-inherent causes of Nyaya-vaisesika are classed under one head, namely, the upadana-karana (the material or the constituent cause) by the Samkhya and the Vedanta schools.

(iii) The nimitta or the efficient cause is different from the two kinds of causes mentioned above. It is the power which helps the inherent cause to produce the effect. The weaver is the efficient cause of the cloth. The efficient cause includes the accessories (sahakari), e.g., the loom and shuttle of the weaver or the staff and wheel of the latter. The efficient cause may be a substance, a quality or an action.[16]

Sometimes a distinction is made between a general or an ordinary (sadharana) and a peculiar or an extraordinary (asadharana) cause. Space, time, God's knowledge, God's will, merit, demerit, prior non-existence and absence of counter-acting factors are the eight general causes. The extraordinary cause is called the karana or the instrumental cause and is included in the efficient cause. In this sense, instrumental cause is a special cause (asadharana karana) or the most effective cause (sadhakatama karana). It is the motive power which immediately produces the effect, e.g., the stuff of the potter. The ancient Nyaya regards an instrument as an instrumental cause, but the modern Nyaya regards the efficiency itself (vyapara) which inheres in this cause as the real instrumental cause.[17]

All these three kinds of causes are meant for positive (bhava) things alone. As for the non-existing things (abhava), there is only one cause and that is the instrumental; or, there can be no relation of inherence between the non-existing things; so that, neither the inherent cause, nor the non-inherent cause can be connected with non-existences.[18] Again, all the three kinds of causes operate together in the production of existing things. Even if any one is absent, there can be no production.

Anyathasiddha (Unnecessary Antecedent)

Anyathasiddhas, in the words of Dr. Umesh Misra are: "The invariable antecedents which are not at all necessary for the production of the effect but are invariably connected with the effect too remotely are known as anyathasiddhas."[19] Conditional or unnecessary antecedents are non-essential, accidental antecedents which do not play any part in the production of the effect. They are not causally connected with the effect; but they are indirectly conjoined with it. Gangesa mentions four kinds of unnecessary (any athasiddha) antecedent.

(1) That which is antecedent to an effect by virtue of its relation to its inherent cause, is its unnecessary antecedent. The colour of a stuff depends upon it as its inherent cause in order to be followed by a jar. The colour of the stuff does not contribute to the production of a jar. So it is its unnecessary antecedent. (2) The cause of a cause is not a cause of an effect. It is a conditional antecedent. The potter is the cause of a jar. But the potter's father is not its cause. The potter's father is the cause of the potter. The potter's father is the remote cause of the jar. But a remote cause is not a real cause. It is an indirect and mediate cause. The cause of an effect must be a direct and immediate antecedent which is necessary for the production of the effect. (3) That antecedent, which is other than the invariable, necessary antecedent of an effect, is its unnecessary antecedent. The prior non-existence of colour is an unnecessary antecedent. Of smell due to heating, since the prior non-existence of smell is its invariable, necessary antecedent or cause. (4) That which is known to be antecedent to an effect after it is known to be antecedent to some other effect as its cause, is its unnecessary antecedent.

Ether is already known to be an antecedent of sound as its inherent cause so it is an unnecessary antecedent of a jar, though it is its invariable antecedent, since it is not necessary for its production. A cause is determined by its presence and absence both—not by its presence only. Eternal and ubiquitous substances, which cannot be eliminated are, unnecessary antecedents.[20] Vardhamana adds another kind of unnecessary antecedent. (5) That which is antecedent to the effect, together with the cause, is its unnecessary antecedent. A staff is an auxiliary cause of a jar, whose presence is followed by its production, and whose absence is followed by its non-production. It is its necessary antecedent. But the generic character of a staff is not followed by the production of a jar independently of the staff. Hence, it is its unnecessary antecedent.[21] Visvanatha also mentions these five anayathasiddhas.[22] All these invariable antecedents which are not directly connected with the production of an effect are anyathasiddhas or unnecessary antecedents. The invariable, unconditional and immediate antecedents, which are necessary for he production of an effect, constitute its cause. Adventitious, collateral, or unnecessary antecedents or accompaniments should not be regarded as a cause.[23]

Plurality of Causes

Plurality of causes has been rejected in the Nyaya-vaisesika system. According to it, the causal relation is reciprocal. The same cause produces the same effect. The same effect is produced by the same cause. But sometimes we find that the same effect is brought about by a variety of causes. Fire, which is a particular kind of product is produced from different causes, namely, grass, arani (a piece of wood of the sami tree used for kindling fire by attrition), and also a particular kind of jewel (mani). The Nyaya-vaisesika argues that it is wrong to think that there are several different causes to produce a single effect. The specific causes produce specific effects. In the above mentioned example, no doubt, there are three reasons to produce a single fire, but at the same time, the effect, i.e., the fire, is not one but three. In other words, the fire produced by grass is different from the fire produced out of either, arani or jewel. Udayana says that if fire were produced from different causes, then the inference of fire from smoke would not have been possible.[24]

The Nyaya-vaisesika holds that though the effects appear to be the same, yet in reality they have special antecedent consequences. If they are considered with their distinctive features, then specific effects have specific causes. If there is a specific difference in the causes, there must be a specific difference in the effects, even though they appear to be homogenous.[25] A specific cause has a specific effect. Plurality of causes appears to be true, because we ignore the distinctive features of effect. Vacaspati and Jayanta regard the cause as an aggregate of operative conditions, and the effect as an aggregate of necessary consequents. If we take a concrete view of cause and effect both, the doctrine of plurality of causes proves to be wrong.

Thus, according to the theory of the Nyaya-vaisesika, there is an absolute difference between a cause and its effect, and there is entirely a new and fresh production. But, in spite of this, both are mutually bound together by a mysterious tie of relation, so that as long as the effect lasts it inheres in its cause, and even when it does not exist, as for instance, before its production and after its destruction, its non-existence, in both states, technically called pragabhava and dhvamsabhava, is also attributed to the same cause. Kanada's is the first attempt to explore a relation between cause and effect. The evolution and development of science is also based on the implicit faith in the law of causation, as the scientific study means the search of a cause or a number of causes leading to a particular phenomenon.

In brief, Kanada gave the following essentials of casuality:

(1) Substance is not annihilated by itself or by cause.
(2) Substance is characterised by action and attribute and is an inherent cause.
(3) If cause is destroyed, effect will be destroyed.
(4) Non-existence of cause does not follow from the non-existence of effect.
(5) The attribute of the effect is seen to be proceded by cause.

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4. Kesava Misra, Tarka Bhasa, p. 3.
5. D.N. Shastri, Critizque of Indian Realism, pp. 261-62.
6. Gautama, Nyaya-Sutra, 4.1.49, Vatsyayana, Nyaya-Bhasya, 4.1.50.
7. Jayanta, Nyaya-Manjari, p. 495.
8. Uddyotakara, Nyaya-Vartika, 4.1.50.
9. *Ibid.*, 4.1.49.
10. Jayanta, Nyaya-Manjari, pp. 493-96.
11. Kesava Misra, Tarka Bhasa, p. 28.
12. Kanada Vaisesika Sutra, 10.2.1.
13. Sridhara, Nyaya-Kandli, p. 101; Kesava Misra, Tarka-Bhasa, p. 31.
14. *Ibid.*
15. *Ibid.*
16. Kesava Misra, Tarka-Bhasa, p. 31.
17. *Ibid.*, pp. 38-40.
18. *Ibid.*
19. Dr. Umesh Misra, Conception of Matter, p. 235.
20. Udyaya, Nyaya-Kusumanjali, Page 88, Gangesia, Tattvacintamani, p. 56.

21. Vardhamana, Nyaya Kusumanjaliprakasa, p. 65.
22. Vasvanatha, Bhasparichheda, pp. 19-22.
23. *Ibid.*
24. Udayana, Nyaya-Kusumanjali, p. 26,
25. *Ibid.*, pp. 26-27.

CHAPTER 4

CONSCIOUSNESS (SPIRITUAL RESEARCH)

> Science of the highest quality is done by the learned and knowledgeable individuals. It is for all humankind. Practice of science is even better than meditation.
>
> सुविज्ञान चिकितुषे जनाय ।
>
> -ऋगवेद 7/104/12
>
> विज्ञानं वा ध्यानाद् भूयो ।
>
> -छान्दोग्योपानिषद् 7/7/9

4
CHAPTER

Consciousness (Spiritual Research)

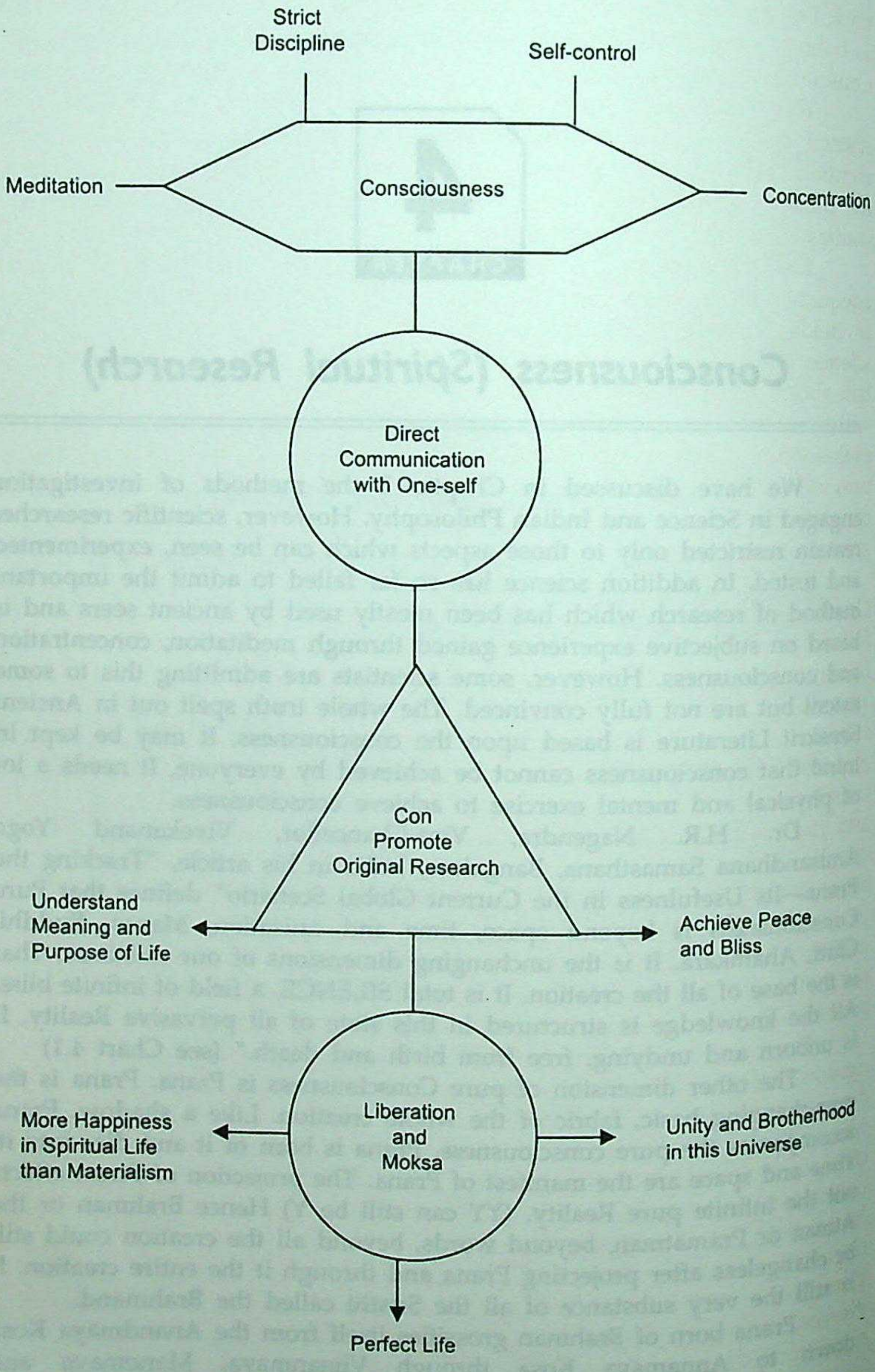
We have discussed in Chapter 2 the methods of investigation engaged in Science and Indian Philosophy. However, scientific researches remain restricted only to those aspects which can be seen, experimented and tested. In addition science has so far failed to admit the important method of research which has been mostly used by ancient seers and is based on subjective experience gained through meditation, concentration and consciousness. However, some scientists are admitting this to some extent but are not fully convinced. The whole truth spelt out in Ancient Sanskrit Literature is based upon the consciousness. It may be kept in mind that consciousness cannot be achieved by everyone. It needs a lot of physical and mental exercise to achieve consciousness.

Dr. H.R. Nagendra, Vice-Chancellor, Vivekanand Yoga Anusandhana Samasthana, Bangalore, India in his article, "Tracking the Prana—Its Usefulness in the Current Global Scenario" defines that Pure Consciousness is beyond space, time and causation, Manas, Buddhi, Chitt, Ahamkara. It is the unchanging dimensions of our existence. That is the base of all the creation. It is total SILENCE, a field of infinite bliss. All the knowledge is structured in this state of all pervasive Reality. It is unborn and undying, free from birth and death." (see Chart 4.1)

The other dimension of pure Consciousness is Prana. Prana is the ever-changing basic, fabric of the whole creation. Like a shadow, Prana accompanies the pure consciousness. Prana is born of it and dies into it. Time and space are the manifest of Prana. The projection of Prana effects not the infinite pure Reality. (YY can still be Y) Hence Brahman or the Atman or Pramatman, beyond words, beyond all the creation could still be changeless after projecting Prana and through it the entire creation. It is still the very substance of all the Sristhi called the Brahmand.

Prana born of Brahman grossifies itself from the Anandmaya Kosa down to Annamaya Kosa through Vijnanmaya, Manomaya and

CHART 4.1


Strict Discipline
Self-control
Meditation
Consciousness
Concentration
Direct Communication with One-self
Con Promote Original Research
Understand Meaning and Purpose of Life
Achieve Peace and Bliss
Liberation and Moksa
More Happiness in Spiritual Life than Materialism
Unity and Brotherhood in this Universe
Perfect Life

Pranamaya Kosa. Science has fathomed the physical world and is set to transit towards higher or subtler Kosa. The frontier research would be to track Pranamaya Kosa. Cancer, AIDS, and Cardiac problems have turned as boons to humanity for expanding the matter based mind set towards Consciousness-based approach.

The inadequacy of one dimensional approach of the modern science to tackle the multi-dimensional, sophisticated health hazards mentioned above and terrorism, single parent problems, divorces, etc. of the modern world have augmented this paradigm shift. Consciousness studies have become the 'in-thing' in the present global scenario.

The problem of conscious self-awareness is not addressed adequately by modern science. Although attempts are made in a variety of fields, including psychology, neuroscience and even philosophy of science, the basic challenge remains that by its nature science can only talk about objective reality, while self-awareness ultimately concerns itself with subjective experience and existence. Yet, Indian perennial philosophies have covered the issue of consciousness extensively and provide means not only to explore intellectually the issue of consciousness but to also lead on through practical steps to realization of great human potential.[1]

The Western thoughts about consciousness, stemming from the Greek philosophers, Plato (427-347 BC) and Aristotle (384-322 BC) followed notably by Rene Descartes (1596-1650), John Locke (1632-1704), Immanuel Kant (1724-1804) and many others, emphasized the dualistic views about mind and brain or in other words, they believed that the substance of mind is different from the substance of brain or any other physical organs or matters. The possibility of a physical interpretation of consciousness became evident with the rise of experimental psychology and psycho-physics in the second half of the nineteenth century. Later on, the American psychologist William James introduced the idea that consciousness involves some form of memory as well as attentional processes but all these newer attributes of consciousness could not be useful because of the behaviourist movement dominating experimental psychology. All behaviours being a purely non-observable mental events, proved elusive to experimental approaches.[2]

During the last few centuries, science and philosophy, in the rigorous pursuit of truth, have crossed swords over the issue of consciousness. Scientists used to ignore the subject of consciousness, as it was, according to them, a subjective phenomenon and therefore considered outside the realm of scientific investigation proper. Similarly, until just recently Western Philosophers treated it as something 'untouchable'. On the other hand, in ancient India, academics of various disciplines accorded a place of honour to the study of consciousness. To them, consciousness (cit, or caitanya) was a fact of experience for everyone. However, the conception of science and the norms of understanding were different in ancient India.

Recently historical circumstances have forced philosophers and scientists of the West to take up seriously an investigation into the nature of consciousness and articulate on the subject. Consciousness is perhaps the greatest mystery today. Modern science has made fantastic discoveries about the physical, neuro-chemical, and information/social basis of consciousness and its various functions, so a congenial atmosphere has been created for exchanging views on this sensitive subject.[3]

Swami Shraddhananda observed that Western Scholars only understood matter and did not go deep into the realm of finer matter seated inside. To quote him:[4]

Western philosophers, psychologists, and physiologists have tried to examine and formulate the nature of consciousness from different viewpoints, and as a result, we have a wide variety of opinions about the origin and function of consciousness. Many of these theories oppose one another; a conclusion about consciousness acceptable to all seems a very remote possibility. However, on the following points these theories appear to have no disagreement. Consciousness

1. is a mental phenomenon intimately related to our brain and nervous system;
2. has no independent existence since birth, growth, and waking depend upon several factors: the sense organs, external stimuli, and the body's physiological functions; and
3. is a sort of guiding light for the biological organism; it is essential for purposive behaviour.

Contemporary thinkers seem to be more interested in how consciousness originates and functions than in what consciousness is. It is difficult for them to look upon consciousness as an entity independent of the object that one is conscious of.[4]

It is thus dear that scientists, in the west failed to find reality as it required different tools for which they were not trained.

Dr. H.R. Nagendra in his book, "Yoga, Its basis and Applications" stress the role of consciousness. The field of neurosciences has advanced greatly and the processes of the brain are understood much better than ever before, thanks to the availability of hi-tech electronic gadgets. The finding that the left half of the brain is the seat of the critical faculty and the right one of the creative and emotional faculties of man is a great breakthrough. The role of the hypothalamus and pituitary glands in the brain, governing all the functions, is now understood in great detail. Yet, it is a mystery to those in brain research as to how new brain circuits are formed and what governs the creative process in the brain cells and its circuitry. As brain research progresses, man realizes the existence of an intricate, invisible, creative hand in all the brain processes. Hence, scientists in brain research have started incorporating "CONSCIOUSNESS" as an independent creative entity governing the processes of the brain. The traditional matter-based world-view that the mind is nothing but a complex process, and the working mode of the brain and its circuitry, are being reluctantly given up. Yet the research on CONSCIOUSNESS has to go a long way.

THE TRANSITION

Thus, in the fields of physics, biology, medicine and neurosciences, we are in a stage of transition. New directions in science are sought. A holistic, more comprehensive world-view has become the need of the era. As one of the leading physicists, Noble Laucreate Professor Josephson remarked, "an entirely new world-view may emerge where consciousness, mind, intellect and life are primary and matter is secondary—an offshoot contrary to our present day understanding that matter is primary and life, mind, etc. are its offshoots. This revolutionary change in our world-view will have far-reaching consequences in our lifestyle, education, value systems, etc. In fact, the Upanisads and other works of ancient Indian wisdom go even further and deeper than Josephson's remarks. They have had a holistic world-view in which the spiritual dimensions of man has been primary and the intellectual, mental, emotional and physical aspects of his personality are secondary and which have to be subordinated to the primary. It is a holistic world-view, that is reflected in the yoga lore and hence is of great interest, even for scientists who are in search of REALITY.

Swami Ranganathananda ji Maharaj in his Address of Benediction at a Seminar held at the Ramakrishna Mission Institute of Culture, Kolkata on 8th and 9th Februrary, 2002 stressed that Science means knowledge; and India's Vedanta says that this knowledge must include the 'knower' beyond the 'known'. The 'known' is studied scientifically today in the West. But what about the 'knower'? It is here, in the field of the knower, that the Upanisads emphasized and did scientific research, by brilliant minds, men and women, over four thousand years ago. Vedanta dealt with this science of the knower, the science of consciousness, along with the science of the known, and considered it as the real science, not as any superstition. And the question is, what is the unchanging Truth? the sensory world we see is a world of constant changes. What we want is Truth which never changes. So in the Upanisads, we find this inquiry rising from the sensory level to the super-sensory level, and not to any supernatural level, and they are carrying out a scientific and systematic investigation which resulted in the long-standing philosophy and spirituality of Vedanta. Satyameva jayate, Truth alone triumphs, proclaims the Mandaka Upanisad.

I sent a copy of my book, Message of the Upanisads, to the distinguished biologist, late Sir Julian Huxley. In his letter, he indeed praised it and also criticized it. I replied to him answering all his criticisms in a long letter; the whole correspondence forms the appendix of that book now.

In this symposium, by our dealing with consciousness, there are two sciences to be acquired, says the Mundaka Upanisad: para vidya—higher knowledge, the science of consciousness or of the knower, and apara vidya—ordinary knowledge, the science of matter. Vidya means knowledge or science. The world is waiting to understand that great contribution of ancient India to the understanding of Truth.

Pointing out the reason for this change in the field of search from the external to the internal, which occurred in ancient India, and its significance for human thought, Swami Vivekananda says (Complete Works of Swami Vivekananda, Vol. III, eighth edition, pp. 330-31):

'Just as the Greek mind or the modern European mind wants to find the solution of life and of all the sacred problems of Being by searching into the external world, so also did our forefathers, and just as the Europeans failed, they failed also. But the Western people never made a move more, they remained there, they failed in the search for the solution of the great problems of life and death in the external world, and there they remained, stranded; our forefathers also found it impossible, but were bolder in declaring the utter helplessness of the senses to find the solution. Nowhere else was the answer better put than in the Upanisads: yato vaco nivartante aprapya manasa Saha—"from whence words unable to reach, come back reflected, together with the mind." (Taittirtya, II.4) Na tatra caksur gacchati na vak gacchati—"there the eye cannot go, nor can speech reach." (Kena, 1.3) There are various sentences which declare the utter helplessness of the senses, but they did not stop there; they fell back upon the internal nature of man, they went to get the answer from their own soul, they became introspective; they gave up external nature as a failure, as nothing could be done there, as no hope, no answer could be found; they discovered that dull, dead matter would not give them truth, and they fell back upon the shining soul of man, and there the answer was found.'

M.V.S. Valithan in his address to the Seminar mentioned earlier said that I am reminded of Prof. Haldane who lived in Calcutta more than thirty years ago. He spoke on the theme of the biological prospects of man in the next ten thousand years. As usual, he was irrepressible. He talked about consciousness and the fate of investigators who chose to explore it. One-third of those who delved within might go mad; one-third might develop brain tumours; and the last third might develop the power to see the past, present and future and an infinite range of consciousness.

Swami Shraddhananda, however made it clear that consciousness cannot be observed in the objects but can be felt within self and hence it needs specialized equipment and training on the part of observer which is highly difficult and technical. To quote him:[5]

This all-embracing characteristic of consciousness can be understood only when we approach it through our own institution.

Viewed objectively in another subject—like a dog or a worm or even a human being—consciousness can be inferred as a unique quality of the biological organism, strictly limited within the organism, functioning under certain circumstances, and subsiding when its function is over. It has no more intrinsic value than hunger or thirst. In this objective view, there is no continuity of consciousness. It is strictly a psycho-biological phenomenon within the organism. It comes and goes with the impulse producing it.

However, when we approach consciousness through our own intuition, it no longer remains a matter of inference. We are in the midst of the radiance of our own awareness. There is no break in that awareness. Objects both internal (thoughts, emotions, feelings, etc.) and external (houses, gardens, people, animals, etc.) pass before that radiance in continuous succession and are instantly "known" to us. But that which links these objects with knowledge is the immutable Consciousness in us—vast, immeasurable, self-existent. It is the core of the personality. It is also the core of our experience. All existence rests in that Consciousness.

Though the true nature of Consciousness has to be grasped through our own institution, it does not mean that each and every person will acquire such knowledge. It has to be developed by years of patient inquiry and discipline. The Katha Upanisad clearly states that what prevents us from realizing the ever-existent Self is our own foolishness: "One who has not first turned away from wickedness, who is not tranquil and subdued, and whose mind is not at peace cannot attain the Atman.

Vedanta would say that this bondage is only apparent.

The true nature of Consciousness—Brahman—can never be blemished or undergo any change. The apparently transitory nature of Consciousness has to be ascribed to the mind with which it is associated. Thought-waves, or vrittis, come and go, but not the consciousness which illumines them. In daily life, however, we cannot detect true consciousness. As a rule we confuse consciousness with the thought-waves of the mind, and as a result, we assume that consciousness is transient, fragmentary, and variable. It is no wonder that some Western scientists equate consciousness with vibrations in the brain.

The Consciousness which surrounds us at all times—inside and outside like time and space—is the highest Reality when we can understand its nature by freeing it from objective ideas which give it the appearance of transience. Consciousness is our own self. All the epithets that describe Brahman, such as Being, Bliss, and Immortality, really belong to the same Reality.

The simplest way to approach this Reality is through our own consciousness.

Highlighting this underlying quantum reality, David Hodgson writes in his book Mind Matters—

'Mind can to some extent be said to be a function of brain, but only if brain is understood not as the detectable macroscopic object, but as the quantum reality underlying both this object and the mental events of consciousness. Mind and brain are manifestations of and view points towards, a "Single reality"; but with important differences, in particular in relation to the development over time of this reality and (specifically) the causes and explanations of such developments'.

While science is moving towards this oneness as the approach to reality for its own reasons, is it not exciting that philosophers in both the East and the West had arrived at the same conclusion by very different considerations and methodologies? this concept of oneness of the underlying substratum has been termed differently in different philosophies—Brahman in Vedanta, Sunyata in Buddhism, Tao in Chinese philosophies. Of course, the contents and mechanisms by which this oneness manifests in the World—the cosmos are very different.

Though the present is an age of Science, we are not sure if all understand correctly what it implies. Different people seem to understand it differently. The villagers has probably not heard about it or think that it is something beyond his comprehension. To many a young student, it may just mean a career. To most of the public it may mean big machines and technology, to social workers modern amenities and comforts, to industrialists a source of fortune for themselves and for the nation and to administrators an item for taxation. To some thinkers its destructive aspect, such as high explosives and Atom Bombs, is repulsive and hence it is an object of condemnation. But careful analysis shows that all these are only some products of Science, many good and many equally bad depending on individual standpoints, and they do not represent the spirit of Science. Many observers have been disturbed by the feeling that science is antagonistic to religion; more science may mean less of religion, less of ethics and less of true culture and all those that we associate with the finer and higher traits of human nature. This is a very important subject and the relation of Science and religion has been engaging the attention of modern thinkers of our country from the time of Swami Vivekananda. A recent discussion is by Swami Ranganathananda who is well-known as a religious teachers and head of the Ramakrishna Mission Institute of culture at Calcutta. The paper entitled Swami Vivekananda's synthesis of science and religion was contributed to the Session of the Parliament of Religious held in January, 1964 and published in book form. Owing to a limitation of time I cannot go into the details of his excellent arguments and the volume of data he has analysed. However, I may state here a few salient points and conclusions.

Indian thought upholds both religion and Science as valid disciplines in the pursuit of truth. India's thinkers never found any contradiction between the two. The method of investigation in the field of religion is largely the same as in the positive sciences. A thorough scientific study of the facts of the inner life was undertaken by the great thinkers of ancient India; the insights which they gained were re-tested and amplified by a galaxy of subsequent thinkers. It is because of this that Indian spirituality has stood the test of time and is also fully hospitable to modern Science.

He then concludes that there is no conflict between Science and religion. Both have the identical aim of helping man to grow in spirituality, and of ushering in a better social order. Each by itself is insufficient and helpless. The combination today of the spiritual energies of these two complementary disciplines in the life of man will produce fully integrated human beings and thus help to evolve a complete human civilization. This synthesis is the most outstanding contribution of Swami Vivekananda to human thought of the present time.

It has been the conclusion of many thinkers that great movements in India have always had a basis in spirituality and her part in the harmony of nations is to play the spiritual note. The recent examples of Gandhiji confirms that we have not lost the great tradition. His whole life was a grand effort to spiritualise politics. Will it not be far more easy to bring Science and spirituality together.

INTELLECTUAL AND CULTURAL VALUES OF SCIENCE

From very ancient days Science has continued to have high intellectual and cultural values. Though culture is popularly associated with certain shows, it is not easy to define, as numerous components are involved, the most important being the scientific and rational attitude of mind. Imagine what would have been the level of our ancient culture and civilization if the primary attitude of enquiry and critical assessment and search for truth at all levels, physical, mental and spiritual, was not there. In the modern context, this is forgotten and most of the cultural activities have very little of Science component in them. There is another aspect of Science and that is its importance for mental and intellectual health. All of us know how costly cricket is and all other sports including wrestling, boxing, hunting, mountaineering and travel. Sports are generally intended to foster bodily health and fitness though this is frequently forgotten and the business part and other considerations become dominant. Mind is far more important, powerful and valuable and should be kept in proper health and condition. For the purpose nothing can be better than Science, and many great people obviously took to Science for this primary attraction. Very early in the history of civilization Mathematics and Astronomy received attention. They continue to be attractive even now, though many other aspects of Science have developed similar values in recent years, for example, Particle Physics, Structural Chemistry and Molecular Biology.

A. Chatterji in his address to the Indian Science Congress in 1975 at Delhi observed that both science and technology are so much a part of the cultural, economic, social and political affairs of all modern nations that lack of understanding can have foolish, if not dangerous, consequences leading to unmitigated disaster. On the other hand, the future holds great promise, if science is pursued with dedication and technology is wisely used in the true interests of the community, and not for narrow sectional ends dictated by selfishness and mistrust. This needs the amalgamation of science with humanism. The scientific community has a vital role to play in this matter, the first imperative being to promote its varied aspects at national and international levels of the human implications of science. The aim of Science and technology is not only to meet the materialistic needs of the country but also to create a better world with higher objective and with a conception of global community. The time has come for nations to act in this vision. This is not a difficult task if the nations are really keen to realise the truth that the "World is one, in fact and a potential" and if they could have the perception of the unity amidst diversity, a harmony amidst chaos and if they are prepared to listen to the note of concord throughout the discordant sounds in this universe. Such perception comes from the microcosmic mind provided it is in perfect harmony with the macrocosm (external). Knowledge on this cosmology will help science and technology to achieve the higher objectives when peace will be showered on earth and the whole universe as a single entity will begin to shine in its own glory.

Even some eminent scientists in India are trying to bridge the gap among religion, philosophy and science.

Julian Huxley had earlier said in his lecture on 'The Evolutionary Vision (Evolution After Darwin, Vol. III, pp. 259-60):

'Although it is to his mind that man owes both his present dominant position in evolution and any advances he may have made during his tenure of that position, he is still strangely ignorant, even superstitious, about it. The exploration of the mind has barely begun. It must be one of the main tasks of the coming era, just as was the exploration of the world's surface a few centuries ago. Psychological exploration will doubtless reveal as many surprises as did geographical exploration and will make available to our descendants all kinds of new possibilities of fuller and richer being'.

How we wish that Huxley had known, and other Western scientists of today know, that this scientific exploration of the inner world has been the special activity of India during the millennia of her long history !

We in Vedanta always say: What has been this progress/ Pure Consciousness became manifested, through millions of years, as millions of living species of beings, along with the non-living cosmos. All these have come from Brahman, Pure consciousness. That Brahman is, therefore, involved in every one of them. Even the tiniest creature, the amoeba, has that Consciousness of Brahman within it.

According to Vedanta, therefore, all progress in evolution is evolution of form and more and more manifestation of that Pure consciousness within. Pure Consciousness has no evolution, but forms can evolve. That consciousness manifests very little in an amoeba, it manifests more in an insect and other earlier species, then in birds, then in mammals, then in a chimpanzee, and finally in a human being. So, evolution of structure, and greater and greater manifestation of Consciousness—that is evolution according to Vedanta. That will be the conclusion to which biological scientists also will come in course of time. Evolution is not in consciousness; that is always infinite, indivisible. It is in you, in me, it is in the insect, it is in everything. It can be one, it can be millions, and yet it is always the same. That is the concept of Brahman as Pure consciousness and as the one source of the whole universe, in Vedanta. And that pure consciousness is the source of all values at the human level. As mentioned earlier, Huxley says: Human values are doubtless essential criteria for the steps of any human progress. We do find progress at the human level of evolution. A person who is wicked, a person who is exceptionally good—can't we make a distinction between the two and call it progress/What else is the word progress/And this progress is progressive manifestation of the Divine within. In the beginning, there is very little of this manifestation, but the Divine begins to manifest more and more when the instruments called the body and the mind become purer and more subtle, just as a lantern manifests more and more light as you clear the chimney of all the black soot that is there; or when the mirror is cleaned, you see your face clearly. Manifestation increases as the purity of the media increases.[6]

The late Bertrand Russell emphasized, in the post-war period, the very unsatisfactory human situation of the modern world and proclaimed that a little love in the human heart, he calls it Christian love, alone can save the world. The late Sorokin of the Harvard University emphasized the need for a little altruism in the human heart. The bhakti expounded in this lecture, where love of the God and love for all human beings in whom the God of Love resides, is capable of meeting that demand of the modern age.

The ancient philosophical concepts about consciousness, originating from India nearly three thousand years ago, emphasized a holistic viewpoint by hypothesizing that mind and matter are two aspects of the same reality. Our Upanisads and the Samkhya Philosophy have given a new insight into the conscious state of mind by emphasizing the consciousness of the individual or 'Atman' as one and same with the consciousness of the universe or 'Brahman'. Thus, according to the great Upanisadic teaching, Sarvam Khalvidam Brahman—'everything else in the universe is the integral part of Brahman'.[7]

According to the Vedanta scriptures, the entire universe, including the mind, is composed of five elements which are the cause of all things. The first and most subtle of these five elements is akasha, or space. By a slow process of evolution, air comes from this fundamental akasha. From air, energy evolves; from energy, water comes; and then finally from water, matter in the solid state comes. We should remember, however, that these are all symbolic expressions of actual spiritual experiences. In other words, at one stage the mind perceives this universe as solid and material, but later, as the mind develops, matter is forgotten, and the universe appears to be made only of energy. In this way, through objective analysis, we can experience increasingly subtler levels of reality.

The sages say that Consciousness is the basis of akasha, or space. Consciousness is beyond both space and time; it is beyond all our normal experiences. The space-time continuum is not final. Beyond space-time is the vast, impersonal reality of God as Satchidananda - infinite Existence, Consciousness, and Bliss. And these three, according to Vedanta, are one.[8]

One may propose a test at this stage. If what has been said so far about the Nyaya view of consciousness is correct then it should be possible for a Naiyayika to incorporate in his system the recent scientific and experimental findings which are generally accepted as relevant for the scientific study of consciousness. It should be possible for him to say, for example, that the correlated brain processes are the causes of consciousness and that brain is the set of consciousness. We have discussed on another occasion how and in which sense the Nyaya theory of consciousness successfully passes this test. According to Naiyayikas, the whole bodily structure of man is related somewhat causally with the non-absolute origin of consciousness in man in the sense that certain specific form of association or relation with such a body is necessary condition for the very possibility of consciousness. But for all that there is good reason why this body or any part of it cannot be the seat of consciousness.

We will be suggesting that the prospect of finding a scientific theory or explanation of consciousness will increase if we change the current conception of science by incorporating into it some of the salient and relevant insights and rationally and logically founded theses of the Nyaya system of thought. Of particular importance and relevance, we think, are the insight regarding the inadmissibility of the question of absolute origin of consciousness and the theses that both consciousness and matter are equally real and that causality operates across different orders of thing.[9]

From our above discussion of Western and Indian philosophy it follows that Western philosophers, by and large, have emphasized materialism, behaviourism, eliminatism, functionalism, reductionism, or naturalism. On the contrary, Indian Philosophers, by and large, remain non-materialists, non-reductionists, or non-eliminativists. They have treated consciousness as a natural phenomenon. Hence, in general, they have not tried to reduce it to something else. This also may be due to the fact that Indian philosophers have emphasized certain values such as liberation (moksa). Some liberation is related to the mind or soul; consciousness which is not identified with brain-states is indispensable for the realization of liberation. Since Western philosophers have tried to reduce consciousness to something else, they faced either the problem of generation or the problem of combination.

Moreover, it has been tried to show how Indian Philosophers can suggest solutions to some of the problems of the contemporary representation theory. They can explain all types of cognition or belief without postulating any possible worlds or any intermediary entities such as propositions or images. Indian philosophers have discussed at length certain problems such as the revelation of mental states. Since there are several theories of revelation, Indian philosophy would make a significant contribution to this type of problem. Hence, it is relevant to contemporary Western philosophy.[10]

Swami Vivekananda called Newton and Galileo 'Prophets of physical sciences' and the Upanisadic Rishis 'Prophets of Spirituality', and declared that 'the whole universe, mental and material, will be fused into one.[11] He also prophesied that any branch of knowledge, even physics, when properly followed, would reach the same conclusions, which the explorations into the psychic-spiritual world would ultimately reach.[12] Today the latest explorations in different branches of science show how science is increasingly accepting the conclusions of Advaita Vedanta philosophy.

ONE CONSCIOUSNESS BEHIND MENTAL STATES, PLANTS, AND HUMAN BODY—J.C. BOSE

It is Indian scientist Sir J.C. Bose who for the first time experimentally proved that plants and metals respond in the same way to external stimulus as conscious human beings. In 1901 J.C. Bose demonstrated his epoch-making experiments in the physics section of British Association at Bradford. Scientists saw with wonder the similar curves of human muscles and metals and plants, when they were responding to the effect of fatigue, depression and poisonous drugs. Peter Tompkins and Christopher Bard wrote on Bose that the Western science was dealing with a genius half a century ahead of his time. Bose's discovery conclusively proved that the same consciousness pulsates in man, plants, and even metals in various ways. Bose summed up the essence of his findings:

'In many investigations on the action of forces on matter, I was amazed to find boundary lines vanishing and to discover points of contract emerging between the living and non-living'.

The physicist, the chemist and the biologist come in by different doors, each one in his own department of knowledge, and each comes to think that this is his special domain unconnected with that of any others.

Hence has arisen our present division of phenomena into the worlds of inorganic, vegetal and sentient. This philosophical attitude of mind may be denied. We must remember that all inquiries have as their goal the attainment of knowledge in its entirety.[13]

Erwin Schrodinger only echoed Sir J.C. Bose when he wrote nearly three decades later:

'Consciousness is never experienced in the plural, only in the singular. How does the idea of plurality (so emphatically opposed by the Upanisadic writers) arise at all/ . . . Much sillier questions have been asked: Do animals have souls/ It has even been questioned whether women, or only men have souls. . . . The only possible alternative is simply to keep to the immediate experience that consciousness is a singular of which the plural is unknown.[14]

Vedant philosophy asserts through all the Upanisads that it is one consciousness which manifests through the myriads of entitles within universe, living or non-living. Sarvam khalu idam Brahma, everything in this universe is Brahman, says Chandogya Upanisad. The Upanisad asks us to see the One Supreme Consciousness in all things of this phenomenal universe (Isavasyamidam sarvam yat kinca jagatyam jagat).[15]

The language of ordinary life is becoming less capable of describing exactly what the scientists are observing or discovering in experiments. Physicist John A. Wheeler in a recent interview remarked: 'Increasing knowledge of detail has brought an increasing ignorance about plan.[16] The Cosmic Code has become invisible. The unseen is influencing the seen.[17]

Max Planck, Heisenberg, Schrodinger, Nields Bohr, and John A. Wheeler and some other scientists turned to philosophy. Some of them dived deep into the Upanisads to get answer to the problem of modern science. On January 25, 1931, Observer published an interview with Max Planck by J.W.N. Sullinvan. In answer to the question, 'Do you think that consciousness can be explained in terms of matter and its law/' Max Planck answered that he did not.

'Consciousness', max Planck continued, 'I regard as fundamental, I regard matter as derivative from consciousness. We cannot get behind consciousness. Everything that we talk about, everything that we regard an existing postulates consciousness.[18]

When Planck's book "Where is Science Going"? was published in 1933, Einstein wrote in the introduction of the book that Planck is inspired by 'a huner of soul'.[19] Observer commented on the book: 'Professor Planck is so great a scientist that he can transcend the limits of his own scientific work, and enquire into its philosophical implications.[20] A scientist, says Planck, 'constructs his ideas from the message from consciousness.' 'Consciousness or an Inner Light proceeding from a greater power than ours', says Eddington, 'beckons us ahead in the intellectual pursuit of science. In this sense, perhaps, the God within creates the God in Nature.'[21]

Swami Vivekananda anticipated this culmination of Western physics in Vedanta as early as 1895 when the new physics of this century had not even been dreamt of. At the Thousand Island park in New York State he said:

'Modern science has really made the foundations of religion strong. That the whole universe is one is scientifically demonstrable. What the metaphysicians call "being", the physicist call "matter", but there is no real fight between the two, for both are one. Though an atom is invisible, unthinkable, yet in it are the real power and potency of the universe. That is what the Vedantist says of Atman.'[22]

Swami Vivekananda further said:

'Physics is bounded on both sides by metaphysics. So it is with reason—it starts from non-reason and ends with non-reason. If we push inquiry far enough in the world of perception, we must reach a plane beyond perception. Reason is really stored up and classified perception, preserved by memory. We can never imagine or reason beyond our perceptions . . . only for the infinitesimal portion of the universe which comes into some perception, are we able to find a reason. Never can we give the reason for any fundamental principle.[23]

'The highest level does not violate the principles of the lower. It simply is not exclusively bound or is explainable by them', writes Ken Wilber, 'the higher transcends but includes the lower and not *vice-versa*. Thus, life transcends but includes matter; mind transcends but includes life; soul transcends but include mind, and spirit transcends but includes soul. Soul transcends but include mind, and spirit transcends but includes soul.'[24]

Swami Vivekananda anticipated this holistic and mystical approach and hoped that modern science would take and turn from matter to the transcendental consciousness hidden in human beings:

'Religion is the science which learns the transcendental in nature through the transcendental in man. We know as yet little of man, consequently but little of the universe. When we know more of man, we shall probably know more of the universe. Man is the epitome of all things and all knowledge is in him.[25]

A.D. Reincourt observes: It might well be that mankind is now on the threshold of a psychological and physiological revolution of a magnitude that will overshadow all the social and political revolutions of our century—made possible by the seemingly incongruous yet perfectly logical marriage between science and Eastern mystical insights.

Human consciousness is conceived of as a subject of study by neuro-scientists, philosophers, anthropologists, psychologists, and linguists among other sitting under one roof. Human consciousness has the elemental force of influencing every human being's daily as well as episodic life and is thus of fundamental significance for studying human life as an individual as well as a collective entity. Yet, little attraction has been paid to the formation and the almost daily mutation of this phenomenon.[26]

The quest for human reality is possibly the central quest of philosophy and no less important in science, though the methods of enquiry in the two are different. Philosophy starts with the self-experience of the human person, science with the observation of his physical presence. 'Who am I' has been the principal question to which Vedanta addressed itself. The Buddha too endorsed the enquiry but advocated the negative method of excluding the non-self. These two were the leading approaches to the problem of the self in India. Philosophical enquiry was accompanied by meditational praxis and so the science of Yoga developed as the science of consciousness. The states of consciousness are as objective, transient and causally determined as the states of the body but being inherently imperceptible by sensory means they can be correlated with but not identified with the states of the brain and nervous system. Freedom, truth, goodness and other such ideal values are manifested only in consciousness for the self. The self revealed in the subjectivity of self-consciousness can neither be a fleeting object nor a deniable illusion. Such a philosophical interpretation of the nature of man is perfectly consistent with the findings of neuroscience though not with naturalistic humanism. This theory of man or a self or spirit revealed in consciousness but different from changing states of consciousness is confirmable by Yogic science which relies on introspection, intuition, inter-subjective agreement and predictable practical consequences.[27]

Birth of Science, One can easily think of another title for this presentation: Birth and Acceptability of Science. Science is not born either in library or in laboratory. Science is not peculiar either to head or to heart. Mother of science is the experience of limitless possibilities, not limited necessities. In making science possible both heart and head, library and laboratory, spontaneity and creativity contribute and are at work. This is not to deny the traditional wisdom hidden in the maxim; necessity is the mother of invention. The limit of the implication of the maxim is clear when one points out that though sub-human animals have their numerous necessities but have no science in the received sense. Science as institutions is peculiar to humanity.[28]

Scientific enquiry has often been a victim of two serious errors. The first is unexamined belief that it is from the experience of the particulars, through a sort of inductive method, the scientist infers general truths of laws.[29] The second is the supposed dichotomy between experiment and experience.[30]

Reflective consciousness reveals that man does not rather cannot, experience any particular thing as such. To his experience everything appears as a particularization or exemplification of some or other general truth. Human experience because of its native spontaneity always views everything as instance of a general truth of law. This transcendental orientation of the human mind is natural, not metaphysical (in the pejorative sense).

It is interesting to recall, in this connection, that in the Indian tradition of thought there is no fundamental division between induction and deduction. The basic structure of inference, anuman, has in it both universal (vyapti) and particular (udaharan) components. These two components cannot be sharply demarcated. Even the distinction that is drawn between them in the analytic mode of human thought is embedded in a synthetic whole. Synthesizing tendency of the human mind is rooted in the spontaneity, spontaneous creativity.[31]

Whatever may be the case, it is undeniable that human consciousness has in it so many hidden possibilities which cannot be readily summoned for either remembrance or use. At the same time, it seems from the cases cited above that the scientists who are historically credited with great discoveries had been found to be in deep engagement over a lone time with the concerned subjects in their problematic form. Negatively speaking, it may be pointed out that, ordinarily speaking, great mathematicians or physicists are not found to have authored masterpieces in literature or poetry or in the areas with which they did not have deep acquaintance or engagement.[32]

Swami Yatiswarananda in his book, "Meditation and Spiritual Life" clearly defines that first we come in touch with the cosmic vibrations, next we come in touch with the cosmic mind, and then we feel the contact between our finite consciousness and the infinite consciousness. From one point of view, all these are concentric circles, one inside another. We can live on the plane of thoughts, we can reduce our body and that of others to mere thoughts, we can then silence these thoughts forms, and reach the plane of the Impersonal and enjoy supreme peace and blessedness. There must be three types of verifications of a spiritual experience: 1. Verification of my own experience by repeating it again and again. 2. Verification of my own experience by comparing it with what I heard from my teacher. 3. Verification of my own experience by comparing it with what is said in the true scriptures. If we do not make these verifications, there is great scope for self-delusion and our experiences may even become dangerous fancies of an uncontrolled mind.

When we have body consciousness, we must be in tune with the physical world; when we are at the mental plane, we must be in tune with the cosmic mind; and when we rise to the spiritual plane, we should be in tune with the supreme Spirit. The light and joy and harmony that we feel at the higher planes must be brought out and made to manifest in the lower planes. Then we become channels of divine power, wisdom and bliss for the good of the world.[33]

Consciousness is a self-reveling experience. Nobody can see consciousness outside. Again, when I see an ant crawling toward a grain of sugar, I infer that there is consciousness in that ant. If I see a man sitting motionless against a tree, I wonder, is this man dead/ I go near and touch him. His body is there, but when I put my thumb under his nose I can detect no breath. When I push him there is no response. Then I say, "He is dead." Consciousness in others is not a direct experience—it is inference; but my consciousness is a direct, spontaneous experience for me. It does not need any other proof. Consciousness can be compared to light, because like light it reveals things. Though consciousness I know that this is my body; I know that it is four o'clock; I know that I am hungry or angry. In other words, whatever I experience needs the light of Consciousness for its revelation.[34]

Prana has its limitations. The mind also has its limitations. But does consciousness have limitations/ Based on the experience of the seers and sages, Vedanta comes to the conclusion that Consciousness is completely separate from the prana and the mind. That is why we read in the Upanisads: "he is the life of life." This means that consciousness is more fundamental than the life-principle; it is more important than the psychological principle. "They who know the life of life, the eye of the eye, the ear of the ear, the mind of the mind, have realized the ancient Supreme Brahman.[35]

Consciousness is something like a study, unchanging light that throws its rays upon every thought; it is then that these thoughts become significant. Without this ray of light, no thought become significant. Without this ray of light, no thought is possible, no experience is possible, no action is possible. The individual mind holds within itself a very precious treasure, the treasure of Consciousness. And this consciousness is not an individual consciousness, in the sense that we speak of our individual minds. This consciousness has no limit. Nothing can bind this consciousness. All that we think of, and all that we come in contact with, is in the category of the second aspect of the mind, that of thought content—the drishya, or the objective element of the mind.

The conscious element of the mind is birthless and deathless. The individual mind always carries this great power, but we are not careful enough to see it. It is this conscious element that knows and gives our personality a sense of identity in and through all possible states of life. The purposè of Vedanta inquiry is to make us understand this aspect of the mind.[36]

We can see that this permanent element of the mind, Consciousness, is nothing but the cosmic mind. If for a moment we can identify ourselves with this consciousness, which is behind our world of experience—our bodies, thoughts, and actions—we shall know ourselves to be infinite, the infinite Mind upon which all this manifold creations manifested. Everything in this universe then becomes a thought of that cosmic mind which is consciousness.

The moment I identify myself with that cosmic mind, I find that the whole universe is in me. This body, and whatever else exists in this world, rests in me. That is the declaration of Vedanta, and that is the real truth of the cosmic mind.[37]

CONCLUSION

Consciousness is the true basis of evolution of knowledge which can help in achieving peace and bliss in this world while scientific research has engaged in providing tools which have been misused to destroy this universe and create more problems than solutions. The need of today is to bring the scientific tools of Research and Consciousness together to make the life of the people peaceful and fruitful.

Unless the humanistic essence of science is properly understood and practiced, one is likely to be misled by its non-essential characteristics like mathematical language, quantitative approach, proof, emphasis on causality, laboratory experiments, theory and test and similar other things. Each one of the so-called defining characteristics of science, if not suitably qualified and contextually situated, turns out to be misleading and dangerous. Humanistic essence of science would help us to approach consciousness.

Consciousness as a tool of research is very tough as it requires concentration, meditation and strict discipline to control, physical activity so that the person can be in direct communion with himself and can come out with original research. All our ancient Sanskrit Literatures is based on such type of research and that is why all the findings based upon such research are coming true even on the touchstone of science which are at physical plane while those at conscious level are beyond the comprehension of science. What is needed is to intensify the tool of consciousness to understand the basic questions of life and death and purpose and meaning of life.

So far as the West is concerned, it is perfectly true. So far as India is concerned, she discovered that goal long ago, that when you get a certain measure of sensory satisfaction, you are to go beyond the sensory and the physical. There are higher dimensions to achieve; do not think that this sense-bound life is the only one. That kind of knowledge had come to our sages, and you have got the whole of this mass of knowledge given to humanity in that one word, Vedanta, comprising the Upanisads and the Gita, as I have discussed in the first two lectures.

We can get echoes of this message in the spiritual part of the world's higher religions. But a systematic, scientific investigation and exposition of this subject can be found only in the Upanisads.[38]

Consciousness is the highest spiritual tool of research for peneterating into the human lives to discern that which cannot be observed by naked eye. All the philosophical research in India by ancient seers are a result of the process of consciousness. For example, Buddha got the knowledge of realities of life through enlightenment gained through consciousness. In recent time, Lord Ramakrishanan could see the invisible process in human mind through consciousness gained through constant meditation and concenteration. The essential of consciousness are:

1. Subjective experiences, i.e. knowledge generated by personal observation of one's own processes of inner thinking, contemplating, thought process—both physiological and psychological.
2. Subjective experience requires a rigorous training regulating personal life so that the subject becomes attuned to attend and feel the inner life.
3. The findings of such research through consciousness helps the subject in getting solace and peace by removal of impurities.
4. Such subjects who get this knowledge through consciousness get liberation—attain Moksa.
5. Consciousness if developed by large number of individuals may promote unity and brotherhood in this universe.
6. Knowledge gained through consciousness if implemented would bestow heavenly bliss on people.
7. People would find more happiness in spiritual life than rat race for materialism.

It is a good sign that present generation including eminent scientists and scholars are feeling dissatisfied with the present development of science and technology as this has created large number of problems in the society. What they want is peace of mind which is possible only with the art and science of consciousness.

Swami Tejomayananda beautifully explains that happiness lies within: If there is no happiness in the objects themselves, then what is the source of happiness/ There are only two entities in this world of experience. One is the subject—"I"—and the other is the world of objects. If happiness is not found in the world of objects, what remains is the subject, "I." So, happiness is me, my true and essential nature; happiness is not the nature of my body, which itself is an object. This "I" is pure consciousness, pure existence, which illumines the inert body and makes it sentient. This pure consciousness is all perfect, and that is my true nature. It is not something outside. Whenever we experience happiness, in sleep or in sense pleasure, we always close our eyes. At the time of a beautiful or blissful experience, our eyes just naturally close with happiness. Why/ It shows that the experience of bliss and happiness is not something outside; it is deep within our own selves. A realized man lives with this awareness.

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CHAPTER 5

KNOWLEDGE OF THE PHYSICAL WORLD

> Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
>
> —*Jeewan Kumar*
>
> O Mother Earth ! Sacred are the hills, snowing mountains, and deep forests, be kind to us and bestow upon us happiness. May you continue supporting people of all races and nations.
>
> —*Atharva Veda* (c 1200 B.C.)

5
CHAPTER

Knowledge of the Physical World

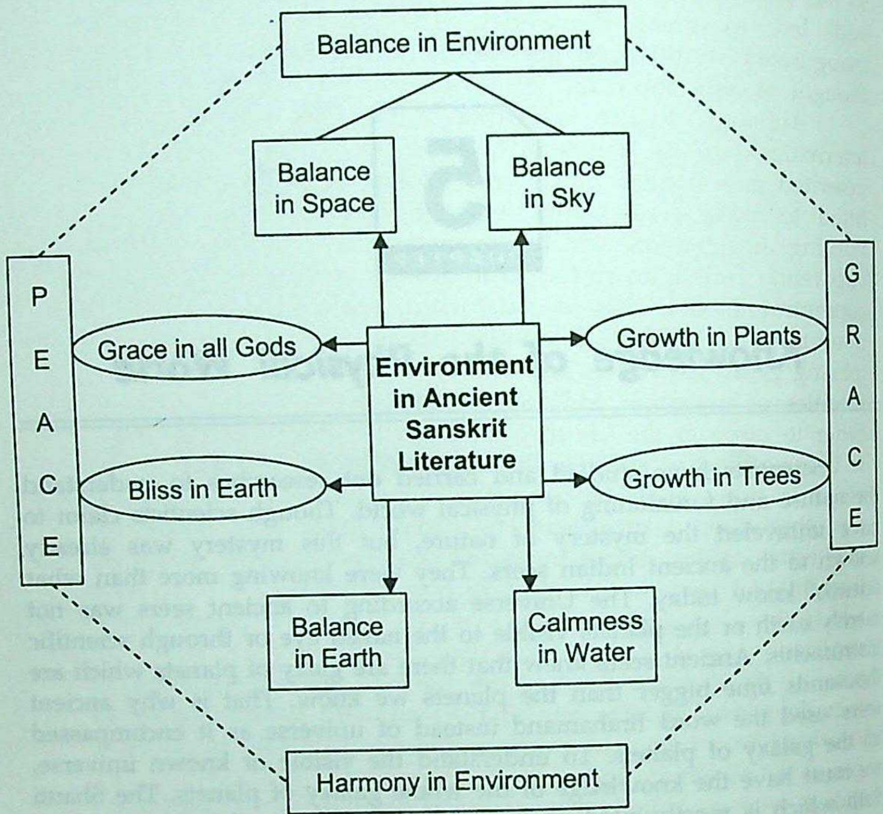
Scientists have studied and carried out researches to understand the nature and functioning of physical world. Though scientists claim to have unraveled the mystery of nature, but this mystery was already known to the ancient Indian seers. They were knowing more than what scientist know today. The Universe according to ancient seers was not merely earth or the planets visible to the naked eye or through scientific instruments. Ancient seers knew that there are glaxy of planets which are thousands time bigger than the planets we know. That is why ancient seers used the word Brahamand instead of universe as it encompassed all the galaxy of planets. To understand the visible or known universe, we must have the knowledge of the whole galaxy of planets. The Shanti Path which is mostly cited on most of the functions of Indians make a mention of this vast universe. (See Shart 5.1)

To me as a student of Sanskrit, environment includes study of all human beings in their physical, social, psychological and spiritual needs and relationships as well, their environment in terms of water, air, plants, animals and heavenly bodies. Ancient Sanskrit literature considers environment cosmic in sweep and it includes transcendental and psychic categories besides physical and natural.

Prof. S.A. Sarma reminds us that "moon is the presidig deity over the natural functions in man; it represents the mother principle in nature; also it represents the natural processes requisite for survival, those import endocrinal gland system and exerts its influence upon the control and proper working of the vital centers, sustaining growth and nourishment. Astrological doctrines lay down that the moon in any horoscope has bearing on the emotional make up and personality of the man. It is the moon that so ensures the natural harmony, rhythm and poise in man's existence.

J.C. Bose in his address to the Indian Science Congress in 1927

CHART 5.1


Balance in Environment
Balance in Space
Balance in Sky
PEACE
GRACE
Grace in all Gods
Environment in Ancient Sanskrit Literature
Growth in Plants
Bliss in Earth
Growth in Trees
Balance in Earth
Calmness in Water
Harmony in Environment

observed that, Nothing can be more untrue than the ignorant asserting that the world owes its progress of knowledge to any particular race. The whole world is interdependent, and a constant stream of thought has throughout ages enriched the common heritage of mankind. It is the realization of this mutual dependence that has kept the mighty human fabric bound together and ensured the continuity and permanence of civilization. Hellenistic Greeks and Eastern Aryans had met here in Taxila to exchange the best each had to offer. After many centuries the East and the West had met once more and it would be the test of the real greatness of the two civilizations that both should be finer and better for the stimulus of contact.

When I commenced my investigations about forty years ago, it was held that by its very peculiar constitution, the Indian mind would always turn away from the study of nature to metaphysical speculations. India was regarded as a land of magic and mysticism where no advance of positive knowledge could be expected. The hypnotic suggestion of inaptitude could only be removed after years of effort, and it is only recently that the generous declaration was made at the meeting of intellectual cooperation, League of Nations "that India had hitherto been to the West, a land of dreams; they now recognized that these dreams had led to great discoveries. The intellectual cooperation now inaugurated would open out for the world the enormous reserves of thought of Asia, the cradle of civilization."

Although Science is neither of the East nor of the West, but international in its universality, yet India, by her habit of mind and inherited gifts handed down from generation to generation, is specially fitted to make great contributions in furtherance of knowledge. The burning imagination which can extort new order out of mass of apparently contradictory facts, can also be held in check by the habit of concentration; it is this restraint which confers the power to hold the mind in pursuit of truth in infinite patience. The specific requirements for making great discoveries are vivid imagination, clear inner vision, great faculties of invention and experimental skills of the highest order. In order to discover the life mechanism in the interior of the tree one has to become the tree and feel the throbbing of its beating heart. This inner vision is, however, to be frequently tested by results of experimentation; for other-wise, it may lead to wildest speculation subversive of all intellectual sanity. A true inquirer has at every step to compare his own thought with objective reality; he has remorselessly to abandon all in which these are not agreed. Even in this path of self-restraint and verification, he is making for a region of surpassing wonder. When the note of the audible reaches the unheard, even then he gathers the tremulous message. Undaunted by limitations of our senses, he has to create artificial organs of unimaginable sensitiveness which requires great genius of invention and skill of construction. It is enough to say that Indian workers have shown a special aptitude in advancing science by their faculty of introspection, experimental skill and great power of invention.

Lord Rutherfod in his address to the Indian Science Congress at Calcutta in 1938 observed that while the study of modern Science in India is comparatively recent, and naturally much influenced by Western ideas, it is well to recall that India in ancient days was the home of a flourishing indigenous Science which in some respects was at the time in advance of the rest of the world.

The study of ancient writings has disclosed in recent years the extent and variety of these scientific contributions. Much progress was made in the study of Arithmetic and Geometry, while the researches of Sir Prafulla Ray have brought to light the important advances made in metallurgy and Chemistry. May we not hope that this natural aptitude for Experimental and abstract Science, shown so long ago, is still characteristic of the Indian peoples, and that in the days to come India will again become a stronghold of science, not only as a form of intellectual activity but as a means of furthering the progress of her peoples.

H.S. Bhabha, in his address to the Indian Science Congress, Bangalore (1951) observed: It is important to note that laws or regularities of nature of the type just mentioned are merely empirical statements of properties observed to be common to a large number of objects. They are all unconnected with each other. In order to connect up such regularities with each other it may be necessary to formulate certain more abstract principles or postulates from which the various observed regularities can be deduced. Newton's fundamental laws of motion exemplify this new approach. Consider his first law, which read.

"Every body continues in its state of rest, or of uniform motion in a right line unless it is compelled to change that state by a force impressed upon it."

Assuming that we understand intuitively what is meant by rest or uniform motion in a right line, we may well ask ourselves what is meant by an impressed force. If we turn to the definitions which Newton has placed in a few pages at the beginning of his Principia, we find the answer in Definition IV:

"An impressed force is an action exerted upon a body, in order to change its state, either of rest, or of uniform motion in a right line."

Expressed in this way Newton's first law would appear to be a tautology: One states that a condition A exists unless interfered with by the existence of B. While B is defined to be present when the condition A is interfered with. It is not the purpose of this discussion to minimize in any way Newton's achievement which is one of the greatest monuments in the history of Science, but to understand the real nature of his laws. Let us assume that force can be defined in some other way than in the above definition so as not to make the first law a tautology. One might then imagine the first law to be a statement which we arrive at from direct observation through some process of induction. For example, in commenting on his first law Newton writes.

"Projectiles continue in their motions, so far as they are not retarded by the resistance of the air, or impelled downwards by the force of gravity. A top, whose parts by their cohesion are continually drawn aside from rectilinear motions, does not cease its rotation, otherwise than as it is retarted by the air. The greater bodies of the planets and comets, meeting with less resistance in freer spaces, preserve their motions both progressive and circular for a much longer time."

The inference is that one may conclude by induction that if we could take a body into space to a very great distance from all other material bodies then it would either remain at rest or move in uniform motion in a straight line. We know today that such an induction cannot be made, and may indeed not even be true for the actual world. While it is possible mathematically to assume a world in which Newton's laws are strictly true, it is equally possible mathematically to think of worlds in which they are not. This analysis shows us that strictly speaking Newton's laws of motion and gravitation are abstract mathematical statements which he quite rightly calls axioms. And if they came to be regarded as objectively true it is because the behaviour of objects which could be deduced from them by mathematical reasoning agreed with our direct observations. For example, one could deduce from Newton's laws the regularity observed by Galileo concerning the fall of bodies, the three regularities observed by Kepler on the motion of the planets, and a host of other phenomena. Quite appropriately, his epoch-making work was called, "The Mathematical Principles of Natural Philosophy."

"The great importance of the contributions of Newton to the development of Physics is that it introduced a new approach into Science. It led to the acceptance of the position that the ideas which are to be regarded as fundamental for the understanding of nature are certain abstract concepts or postulates which cannot be proved directly, and not the directly observable regularities of nature which can be deduced from them. This position was accepted because it allows one to order different empirically found regularities of nature into a unified logical scheme which would not otherwise be possible.

It is clear that we are now penetrating into a new level of nature which was practically unknown some twenty years ago. I have pointed out earlier that although there may be a infinite number of types of elementary particles nevertheless this fact in itself does not necessarily force the conclusion that we will never be able to describe nature fully or to explain the physical world exhaustively. On the other hand, we cannot be certain with our present knowledge that a complete mathematical theory of the physical world can be faced with a situation in which we could never hope to give an exhaustive description of everything there is in nature, but only to extend with the flow of time the region which we had explored and understood.

Let us now discuss the nature of Physical World as laid down in Indian Philosophy with special reference to Nyaya Vaisesika. We discuss the important elements, and compounds of this universe like earth, sky, water, air, plants and animals, manas, etc. we should know that the physical world is of great significance to lead a happy and peaceful life in this universe. We can design this universe through the permutation and combination of atoms of various elements and compounds to make life more comfortable. It is therefore essential to understand the nature of this universe as propounded by Ancient Saints. We may keep in mind that physical world is only one part of existence while Moksa is the most important part.

Thus, the physical world is a means through which life can be led in a decent way to pave the way for spiritualism. It is the duty of every human being to maintain the balance among all constituents to protect it from pollution.

Let us now explain the nature of physical world in Indian philosophical system which has been clearly explained and is an advance over today's explanation of science.

Nyaya-vaisesika system adopts a realistic attitude in explaining the world phenomena. This system broadly divides reality into self and non-self. These two realities bear causal sequence. Neither of the two depends upon the other for its existence. Although these two are opposite entities, they co-operate in such a smooth manner that our life and our dealings with the world are harmonized.

The Indian philosophical systems differ on the reality of the physical world. The Carvakas are of the view that there are only four elements (earth, water, fire and air) which constitute the entire universe. All other elements are derived out of these four. Akasa is considered to be that which possesses no obstruction, and perhaps, therefore, includes dik within it. Atman is nothing but an organism, or a sense-organ, or a vital air, or the Manas, endowed with the quality of consciousness, which is nothing but a property of matter generated under certain conditions, just as grains of rice acquire, by fermentation, the power of intoxication.

Not believing in any transcendental world, religion, or morality, the Carvakas think that the body is the sole reality, and consciousness ceases with the dissolution of the body into its constituent elements. This is the crudest form of explanation given by the Carvakas about the phenomenal world.

The followers of the Samkhya-yoga system believe that prakrti (manifested and unmanifested) is as real as purusa. The unmanifested (avyakta) prakrti is real as an ultimate principle. We cannot say the same about manifestation (vyakta). They pass away for individual purusas with the dawn of the discriminative knowledge that the soul and the embodied self are not identical. But even though phenomena are unreal, prakrti as such is real; and when the process of manifestation, starting with mahat or buddhi and ending in the two parallel series with mahabhutas and indriyas, terminates, there continues to be a process of multiplication of the constituent elements (gunas) inside the primordial prakrti. The Samkhya view, therefore, makes a distinction between two orders of reality in the physical universe, namely, in the manifest and in the unmanifest condition. The visible world is thought of as a product of five gross elements, viz., earth, water, air, fire and ether, but in the unmanifest prakrti the gross and subtle elements cease to exist, and we have to think only of their strands, sattva, rajas, and tamas, as constituting its nature. It is obvious that the Samkhya-yoga was primarily interested in the different aspects in which nature appears to us, namely, illuminating, active and stupefying, and that, obviously, this triple aspect was arrived at by a consideration of the ways in which the world of manifestation shows itself. For, according to this particular school, the effect is practically identical with the cause; and unless these three aspects were really present in the original prakrti, they could not have found a place in the manifested universe.

The Advaita-Vedantins reject all the explanations and, in their view, the physical world has only an illusory reality produced by the false projection of maya.[1]

Yogacara system of Buddhism holds the physical universe as a projection of consciousness, but not exactly illusory in character. For all practical purposes, the world is real though changing every moment. The origin of the world is to be traced to the operation of the mind, which is the only reality, is void, yet, compared with the physical projection, the receptacle consciousness (alayavijana) is relatively more real.

Nyaya-vaisesika system, like almost all other realistic schools, attaches much more importance to the material world. The only non-material entity here is the Atman which is conscious. The constituents of the physical world in this system are the eight forms of matter-five atomic and three ubiquitous in nature and their qualities. Five atomic consist of the four productive elements, called bhautika paramu, and the non-bhautika paramanu, called manas. The three ubiquitous forms of matter are: Akasa (ether), kala (time) and dis (dik) which are the eternal background of the creative process.

But in the view of Dr. D.N. Shastri, the four substances—earth, water, fire and air—constitute the matter. There are five more substances—ether, time, space, manas and soul—which are eternal. In as much as they are substances they possess quality and other properties, but still they are not material or physical substances. According to him if the last four eternal substances (i.e., ether, time, space and manas) are included in matter simply because they are substances and possess qualities, or because they are inherent causes of some of the qualities, why should the soul also not be regarded material for the same reason? The eight substances, in fact, have never been grouped together in the Nyaya-vaisesika; and not one property common to all the eight substances has been given in the Nyaya-vaisesika works, or can even be conceived except the negative one, i.e., of having no knowledge. This conception of matter is, therefore, a misconception, and quite alien to the Nyaya-vaisesika.[2]

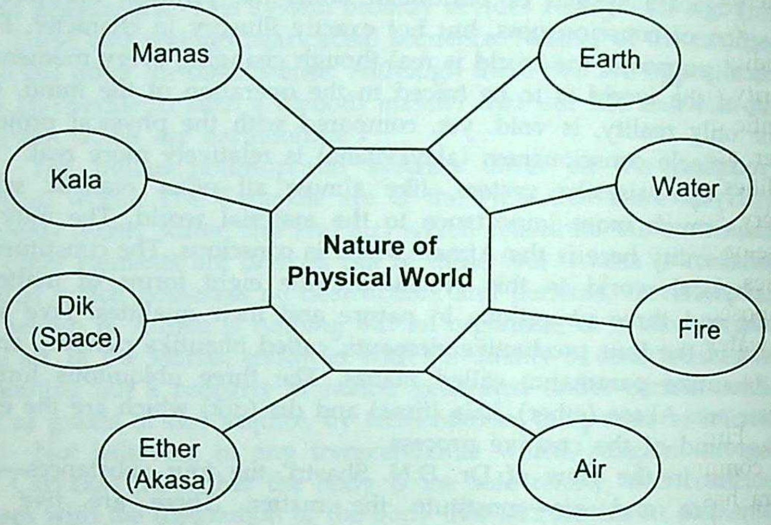
The criticism of Dr. D.N. Shastri is not valid as the Nyaya-vaisesika system adopts the stand-point of the common man that the physical world, as it appears to our external senses, must be accepted as real. The matter in the joint system is that which is other than the substratum of jiiana and has the capacity to possess an attribute. It means that matter excludes the spirit (atman) and' includes all other dravyas recognized by Nyaya-vaisesika.

From the above mentioned discussion we can say that there are eight forms of matter, viz., earth, water, fire, air, ether, dik, kala and manas. Now, we will examine the specific nature of each form of the physical world. (Refer Chart 5.2)

Earth[3]

Earth contains a number of qualities as colour, taste, smell, touch, number, dimension, separateness, conjunction, disjunction, priority,

CHART 5.2



posteriori, weight, fluidity, velocity and elasticity,[4] but smell is the specific quality of earth which differentiates it from all other substances. In Laksnavali, Udayana defines earth as that which possesses the absence of the absolute negation of smell.

The smell possessed by water and other substances is because of the association of particles of earth with them. Earth has, seven kinds of colour, namely, white, blue or black, yellow, green, grey, red and citra (variegated). It has six kinds of taste—sweet, sour, salt, better, pungent, and astringent. It has two kinds of smell, agreeable and disagreeable. Its touch is neither hot nor cold, but varies according to the quality of heat.

Such an earth is of two kinds—eternal in the form of paramanus and non-eternal in the form of products. The latter; form of earth consists of parts which are so combined as to serve some useful purpose of our daily life.[5] Things made of earth are of three kinds, bodies, sense-organs and objects of perception.[6] The olfactory organ is an earthly organ. It can perceive smell, i.e., it is through the activity of the olfactory organ alone that smell, which is the distinguishing quality of earth, is known and not otherwise. The genus of earth subsists in earth.

Water[7]

Water has been defined as that which naturally possesses cold touch.[8] Udayana defines water as that which possesses the generality which belongs to hail, snow, ice, but does not belong to any other substance, such as earth, etc. Candrakanta in Vaisesika-Sutra-Bhasya, refers to that kind of water which is produced by the combination of the two kinds of gases, i.e. Hydrogen and Oxygen (H_2O). It is, no doubt, an artificial one and does not stand, according to him, in the way of the existence of natural water.

Water has the qualities of colour, taste, touch, natural fluidity, viscidity, number, dimension, separateness, conjunction, disjunction, priority and posteriority, weight and velocity.[9] Of these, taste is the specific quality of water. Water is eternal and non-eternal. The atoms of water are eternal. Composite watery substances are non-eternal.[10] The qualities of the eternal atoms of water are eternal. Those of non-eternal watery substances are non-eternal. The products of water are bodies, sense-organs, and objects. The denizens of Varunaloka possess watery bodies, which are not due to sexual union. The gustatory organ is composed of water. It perceives taste. Rivers, oceans, hail and the like are watery objects.[11] The genus of water subsists in water.

Fire

Fire is defined as that which is the substratum of colour, which has the common substratum with the absolute absence of taste.[12] Sanker Misra has defined fire as that which has the common substratum with colour, but not with weight. The definition generally given only enumerates the special characteristics of fire. Fire has the qualities of colour, touch, number, magnitude, distinctness, conjunction, disjunction, remoteness, proximity, acquired fluidity, and velocity. Of these, colour and touch are the only distinctive qualities of fire. It has bright, white colour. It has hot touch. These two do not naturally belong to any other bhuta. The fluidity in fire is unnatural; that is, it is found only when strong heat is applied to it, as in the case of all the metals.[13] The appearance of red, yellow and other colours in fire is due to the presence of earthly or watery substances. In it, Fire is eternal and non-eternal. The atoms of fire are eternal.

The composite fiery substances are non-eternal. The products of fire are bodies, sense-organs, and objects. Fiery bodies are not due to sexual union. They are composed of the parts of earth also which are subordinated to fire. They are fit for producing pleasure and pain. The visual organ is composed of light. It perceives colour. Fiery objects are of four kinds—earthly, heavenly, intestinal, and mineral. Earthly fire is produced by wood burns, cooks, evaporates, etc. Lightening is heavenly fire. Intestinal fire digests food. Gold, silver and the like are mineral fires.[14]

Here the question arises; what is the logic of including metals like gold, etc., under fire? According to the joint-system, solids and minute particles are included in earth; liquids in water; gases in air and combustible substances in fire. Out of solids, metals have been classified in fire. The reason of placing metals under fire is that the metals are good conductor of heat. For example, gold is a metal through which heat can pass from one part to another very quickly. If a unit of heat is passed through gold and water; the rise in temperature in gold would be many times more than that of water. That is why there is a justification of including metals under fire. It would be interesting to go in depth of various aspects of fire substantiated with the modern knowledge of science. The science of physics deals with heat, light, sound, electricity and magnetism. Except sound, all the other four are included under fire in Nyaya-vaisesika system. For example, heat is known in this system as 'usna sparsa' (hot touch), which is the specific quality of fire. Sun is the primary source of heat. The scientific knowledge has also revealed this truth. The sun consists of Hydrogen and Helium; the former is combustible while the latter is the supporter of combustion. In science, the heat is defined[15] as "an agent which produces in us the sensation of warmth, which carries the same meaning as is evident from the term usna sparṣa of the Nyaya-vaisesika. 'Light' of physics is known as 'bhasvara-suklarupa' in Nyaya-vaisesika system, which is also the special quality of fire. Electricity is also a form of fire in this system, though no mention has been made of the application of electricity in its modern form. Magnetism is defined as the force of attraction between a magnet and a magnetic substance. This is a form of energy as all magnetic phenomena are explained in terms of forces between electric charges in motion.[16] Like electricity, it is also included under fire in this joint-system.

Air[17]

Udayana defines air as the substratum of touch and the absolute absence of colour. Air possesses a peculiar type of touch called non-chemical (apakaja) and is neither hot nor cold (anusnasita).18 This particular nature of touch distinguishes it from earth, water and fire. With the specific quality of touch, air possesses number, magnitude, distinctness, conjunction, disjunction, remoteness, proximity and velocity. The motion of air is transversal (tiryak). It keeps the clouds at rest in the sky and also moves them from place to place. It causes the showering of rains, checks the force of weight and does not let the weighty substance fall down. That it helps the air ships and similar other things to fly in the sky[19] is proved from the fact that the contact of a substance having touch is essential to keep things in the sky; and such a substance is no other than air.[20] Air is said to be the instrumental cause of all the fiery products even including gold, etc. It is, therefore, that a lamp light burns only when there is air to help it and not otherwise.[21]

Air is eternal and non-eternal. The atoms of air are eternal. Composite aerial substances are non-eternal. The products of air are bodies, sense-organs, inorganic mass, and vital air (prana).[22] But the Navya Nyaya, however, rejects the fourth kind of air[23] Aerial bodies are not due to sexual union. They are composed of parts of earth also, which are subordinate to air. They are fit for producing pleasures and pains. They are possessed by the denizens of the aerial regions. The tactual organ, which pervades the body, is composed of air. It perceives touch.

Its location is throughout the body.[24] Jayanta explains that by the tactual organ we should not mean the external skin on the body alone but those layers of skin (tvak) also which pervade the entire body, both in and out. It is due to this that cooling and burning touch sensations are felt even in the hearts of heart.[25]

Aerial objects are possessed of touch. They are indicated by touch, sound, support and trembling, which are their marks. Vital air is subdivided into five prana, apana, samana, udana and vyana. Some, again, add five more varieties along with these five. They are: naga, kurma, krkara, devadatta,[26] and dhananjaya. Tantrikas, however, believe in 49 kinds of air.

Akasa

Akasa is the fifth physical substance which is the substratum of the quality of sound. It has been defined as that wherein there exists no absolute negation of sound.[27] It is not an object of sense perception as akasa is not a limited and coloured substance. Therefore, its existence is only an inference with sound as its quality.

Kanada proves the existence of akasa as the substrate of sound. The specific qualities of the products of earth, water, fire and air are produced by the qualities of their material causes. Colour, taste, odour and temperature are special qualities of this kind. But though sound is a special quality, it is not produced by the quality of its material cause. It is a special quality because it has the genus of sound, and because it is perceived through one external sense-organ only. Sound is not a quality of earth, water, fire and air, because the qualities of these substances are not perceived by the ear, while sound is perceived by our ears. Further, there may be sound in regions relatively free from the influence of these substances. Nor can sound be a specific quality of space, time, soul and mind, for these exist even when there is no sound to qualify them. Space, time, soul and manas do not possess any specific quality at all.[28] Hence by elimination the existence of a substance is inferred which alone can be the substrate of sound. Such a substance is called akasa.[29]

The other systems of Indian philosophy, however, do not agree with the above-mentioned view of sound as a quality of akasa. According to the Buddhists, sound is produced out of the disturbance caused in the basic elemental substances. It has no substratum and it is produced and destroyed.

The Jainas hold that sound is a product of subtle sound-pudgalas and, when produced, it travels upto the ear-cavity where it is apprehended.[30]

According to the Samkhya school, sound does not inhere in akasa alone but in all the five gross bhutas and their modifications, such as, a cow, a jar, etc., each of which is an aggregate product of the subtle bhutas produced out of the five tanmatras. It remains in these bhutas along with and in the manner as odour, colour, etc., and is likewise manifested by the forcible contact of a particular bhuta,[31] as for instance, the forcible contact of a stick with a drum.[32] Regarding the process of manifestation, it is said that the auditory sense-organ, being a modification ahamkara, is more extensive (vyapaka) and pervades over the substrate of sound also; so that the sound becomes manifested in its substratum after producing a change in it.[33]

The Mimamsakas hold that, no doubt, sound is a quality of akasa, but it is eternal and all-pervading and is only manifested. According to this view, the air waves, set in motion by a forcible contact or impulsion, move forward until they reach the tympanum and manifest there the sound already subsisting in the ear-cavity—a limited akasa. Sound is held to be eternal according to this view, because its substrate is eternal and its being the quality of akasa wherein alone it inheres, like the all-pervasiveness of akasa.

The Nyaya-vaisesika system holds that sound is non-eternal and is produced without pervading the whole of the object.' According to Kanada akasa is one, eternal, ubiquitous and devoid of a genus. There is no proof for the existence of its parts and hence eternal. Sound is perceived everywhere, which proves ubiquity of akasa. Hence akasa is one, ubiquitous, eternal, imperceptible substance endued with the special quality of sound.

The scientists believe that sound is possible only in air and hence it should be a quality of air and not of ether. But the scientific view is not logical as sound can travel through water as well. Hence, air, water, etc., are only the media and not the substratum of sound. In physics, sound is an energy and one form of energy can be transformed into another. Radio-broadcasting is an example of the transmission of sound energy into electrical energy but this only indicates that electricity is only a medium to change the sound into waves. According to science, sound cannot exist independently without some substratum but science is silent about the nature of this substratum. Hence, the joint-system's view that sound is a quality and it subsists in substance named akasa is quite true.

Dik

Dik is that which sets up certain positional relations among co-existent bodies.[34] It is substantial, infinite and continuous. If dik accommodates discrete objects, it does so only to arrange them in a definite order, so that the position of each of them is definable only by reference to that of others.

The Vaisesika as a realist-conceives space as an objective reality, existing in itself independently of experience. Though an objective reality, it cannot be perceived externally, as it lacks sensible colour and gross magnitude. The existence of dik, therefore, is proved by the relative positions of the various finite (marta) objects of the universe, which is not possible to be explained otherwise. Prasastapada says that dik being supersensuous is inferred through the notions of east, west and the like.

Dik has no specific qualities. It has the generic qualities of number, magnitude, distinctness, conjunction and disjunction.[35] It is one, distinct, eternal and ubiquitous. It has the largest magnitude since it is all-pervading. It is eternal, since it is an incomposite substance and does not depend on anything for its existence.[36]

It may be argued that there are different cognitions of east, west and the like in different places which prove the existence of many spaces. But Sridhara refutes this argument. The very same object is perceived as situated to the east of another object and to the west of a third object. It would not be possible if there are many spaces. But the same object is actually perceived to the east and west both in relation to different objects. Therefore, there is one space which is homogeneous and continuous. The difference of cognition of different directions is due to different determining conditions (upadhi). The east is the direction determined by conjunction of space with the rising sun; the west is the direction determined by conjunction of space with the setting sun. The other directions are determined by reference to the east or the west. So dik is one, but it appears to be many owing to its limiting conditions.[37]

Dik differs from akasa. Akasa is the specific inherent cause of sound. Dik is a general cause of all effects. It is the instrumental cause of the spatial relations of remoteness and proximity. Thus dik is different from akasa.[38]

Kala

Kala is conceived in the Nyaya-vaisesika system as an external entity. It is not a subjective form of perception. It is real and objective. It is one, ubiquitous, and eternal substance, which is the static background against which events happen and from which they derive their chronological order. It possesses no specific physical quality like colour and, thus, cannot be an object of external perception. It is neither perceivable internally, for the mind has no jurisdiction over external or non-physical objects independently of a physical sense-organ. Then, what is the source of our knowledge that kala exists? The Vaisesika answers that the knowledge of kala is arrived at by a series of inferences. First, the notions of priority (paratva) and posteriority (aparatva), of simultaneity (yaugapadya) and succession (ayaugapadya), and of quickness and slowness constitute the grounds of inference of the existence of kala.[39] Kala is the efficient cause of these cognitions. Secondly, it is the efficient cause of production, persistence, and destruction of all effects.[40] Thirdly, it is the cause of the notions of moments, hours, day, night, fortnight, month, year and the like.[41]

Some deny the reality of kala and trace the variety of cognition of temporal relations to different circumstances peculiar to each case. But Sridhara impugns the validity of this argument. If kala were non-existent, there would be no production. But an entity, which had prior non-existence, is produced. Production implies prior non-existence and posterior existence. Priority and posteriority involve time. Thus, production involves the existence of time.

The Buddhists identify kala with change or action, and deny the reality of kala as distinct from actions. There is no perception of time at all, but only that of actions. The cognition of slowness, quickness and the like apprehend actions only. But Jayanta urges that though there is no perception of time apart from actions yet this does not mean that there is no perception of time at all and that actions are always perceived as qualified by time. Time is perceived as a qualification of actions, but not as an independent entity. When we perceive succession, simultaneously, quickness, slowness and the like, we do not perceive, mere actions, but we perceive another entity, which qualifies these actions, and that is time. A peculiarity in cognitions is due to a peculiarity in their objects. Hence, time is distinct from actions.

Though kala is one. It is spoken of as three-fold, i.e., past, present and future owing to the limiting conditions of production, persistence and destruction. Its relation to limiting conditions is real.[42] When an action has not yet begun, it is future; when an action continues in a substance, it is present, when an action has ceased to exist, it is past.[43]

The Madhyamika theory, that there is no present time apart from the past and future, is examined by Vatsyayana.[44] The past is defined as that which precedes the present, and the future as that which succeeds it. But the present has no meaning apart from the past and the future. But Vatsyayana says that we have the conception of time as past when the action of falling has ceased. When the same action is going to occur, we have the conception of time as future; and lastly, when the action of the thing is perceived as going on at the time, we have the conception of present time. The object is actually connected with action, the present is the basis of the actual existing connection of the object and the action. Past and future would not be conceivable if the present time did not exist. Again, perceptions arise in connection with things which are present in time. There cannot be perception if there is not present time. Hence, the past, the present and the future are independent of one another, and real and objective. They are three forms of one time.

Manas

For the clear apprehension of the nature of the world, Nyaya-vaisesika accepts an internal organ, called manas. Bhoga, the ultimate end of this world, is possible through the help of manas only and not otherwise. Manas has been defined as an internal sense-organ which brings cognitions of all sorts.[45] It is that internal sense-organ the absence of which prevents the production of any cognition, even when the sense-organs are in direct touch with their respective objects. Manas being supersensuous, is proved to have an existence through inference alone. Gautama holds the non-production of the simultaneity of cognition alone as the most important cause for the existence of manas. Vatsyayana adds memory, inference, verbal testimony, doubt, dream-cognition, imagination, the experience of pleasure and pain, desire and the rest as indicative of the existence of manas.

Manas is atomic,[46] eternal,[47] and unconscious.[48] It cannot be perceived through any external sense-organ of ours.[49] It is not of the nature of any of the mahabhutas, it is called non-bhautika.[50] Manas does not possess any specific quality, namely, colour, taste, smell, touch, viscidity, natural fluidity, knowledge, pleasure pain, desire, aversion, effort, merit and demerit, mental faculty and sound.[51] It being a form of matter and a sense-organ,[52] has no consciousness. If it were conscious, then there would have been two conscious elements in a single organism,[53] which would have made the production of knowledge impossible and would have thereby upset the entire worldly usage.[54] Being non-bhautika[55] and having motion and velocity,[56] manas cognizes its objects with the quickest possible motion.[57]

There is only one manas in each organism. We know that our cognition, volition and the other perceptible qualities of the self are always successive. They are never simultaneous. Their non-simultaneity proves the existence of one manas in each body. If there were many mana-fist, they would come into conjunction with the different sense-organs and produce different kinds of perceptions simultaneously. But colours, tastes, smells, temperatures and sounds are never perceived simultaneously, so there is a single mana in the body. Sometimes they appear to be perceived simultaneously. But the appearance of simultaneous perceptions of them is due to their rapid succession due to quick movement of the atomic manas and its conjunctions with the different sense-organs in quick succession. The appearance is only illusory.[58] Manas is the only factor which distinguishes one jiva from another. As long as manas remains in an organism, so long that organism is alive, and as soon as it leaves the organism, that organism is dead. Being eternal, it remains attached to every jiva even during the state of cosmic rest. But it does not produce, any cognition during that period for want of an orgamsm.

In the preceding pages of this chapter we have examined the nature of the eight forms of the physical world according to this joint-system. Now, in order to comprehend the ultimate cause of this physical world, we would analyse the atomic theory propounded by Nyaya-vaisesika system as an explanation of this phenomenal world.

Theory of Atomism

The atomic theory of the Nyaya-vaisesika system explains the order of creation and destruction of the non-eternal objects. It is only the composite substances of the atoms of earth, water, air and fire, which are produced and destroyed. The eternal constituents of the universe, the four kinds of atoms, and the five substances of akasa, dik, kala, manas and soul, do not come within the purview of the atomic theory because these can neither be created nor be destroyed.[59]

According to this joint-school, all the objects of this phenomenal world are divisible into smaller parts, which are divisible into more minute parts, until we come to the indivisible atoms, i.e., these atoms cannot be split further and mark the limit of division. Greek philosophers also shared this view. It has been stated by James Jeans that,

"Many Greek philosophers from Democntus onward had imagined matter to consist, in the last resort, of hard indivisible pellets. These pellets were at first called atoms (incapable of being divided)."[60]

Modern science has also propounded an atomic theory to give an explanation of this physical universe. According to it, the whole universe is made up of matter which can be sorted into elements (numbering 105), compounds and mixtures. These elements, compounds and mixtures are made up of atoms which can be further divided into electron, proton and neutron. But even today, the scientists believe that atom is the only smallest particle of matter that can take part in a chemical action.[61]

An atom has been defined in the Nyaya-vaisesika system as an ultimate particle, i.e., it is the minutest part of a thing. It has minute magnitude. It is said to be globular (parimandalya), though it has no parts. Hence, the atom is indivisible. We cannot perceive it through any of the organs of sense-perception. The existence of atoms can be proved with the help of the following arguments adduced by this joint-system.

Firstly, according to Nyaya-vaisesika system, the presence of magnitude (mahattva) in an object is one of the conditions of its perception, but as the atom has negligible magnitude, so the question of its perception does not arise. The existence can be verified from the motes which can be observed floating in the sun-beam entering a room through a little chink. These motes are called trasarenus or truti in the Nyaya system, and represent the ultimate particles of matter in so far as they are visible. Possessed of magnitude and being amenable to sense-perception, these particles must be held to have component parts which, called dvyanukas, must, in their turn, possess similar constituents of their own for identical reasons. The components of these dvyanukas are called Parmanus[62] (atoms) which are indivisible and impossible of further analysis.

Secondly, it is not within the powers of the ordinary men to perceive the atoms but yogins can have the direct perception of the atoms through the sense-organ and object contact.

Thirdly, as the ether has the highest limit of magnitude, so atoms mark the lowest limit of magnitude. There must be a definite limit of a sub-division in the atoms just as there is a definite limit of extension in ether.[63]

Fourthly, composite products are produced and destroyed; they are changeable and divisible. Therefore, they must be composed of ultimate constituents or atoms which are eternal, unchangeable and indivisible.[64] Camposite products are divisible into parts, which also are divisible into smaller parts. But we cannot go on sub-dividing them into smaller and smaller parts ad infinitum. We must stop at the minutest atoms which are indivisible units in order to avoid infinite regress.[65]

Fifthly, if composite substances were infinitely divisible into minuter and minuter parts without end, they would all be composed of an equally infinite number of parts, and therefore, would be of equal magnitude. If they were endlessly divisible into parts, differences (i) their magnitudes could not be accounted for. Even a mountain and a mustard seed would be of equal dimension, because they are equally divisible into an infinite number of minutest parts.[66] So we must admit that atoms are the minutest parts of composite substances, which are indivisible.

There are four kinds of atoms corresponding to four classes of material substances, viz., atoms of earth, atoms of water, atoms of light and atoms of air.[67] The atoms of earth have the qualities of odour, colour, taste and temperature. The atoms of water have the qualities of colour, taste and temperature. The atoms of light have the qualities of colour and temperature and the atoms of air have the quality of temperature. Thus the different kinds of atoms have different kind of secondary qualities. Colour, taste, odour, and temperature are said to be secondary qualities. Besides, the four kinds of atoms have the common qualities of number, magnitude, distinctness, conjunction, disjunction, remoteness, and proximity, which may be said to be primary qualities.

But Democritus and Leucippus, the Greek philosophers, though recognized the reality of indivisible and imperceptible laws, believed in an indefinite number of atoms devoid of qualities, but endued with quantities. According to these philosophers, atoms do not possess qualities but differ in figure, size, weight, position and arrangement. But Kanada, on the other hand, recognized the qualitative and quantitative differences in the atoms, though they are equally indivisible and possess the same minutest magnitude. He did not accept the views of Greek philosophers that the atoms are devoid of secondary qualities. He did not reduce their qualitative differences to quantitative differences.

Though an atom, according to the Jainas, is ultimate indivisible, eternal unit of the physical element like that of Kanada, there is a fundamental difference between the Vaisesika atomism and the Jainas atomism. Unlike the Vaisesikas, the Jainas hold that each atom has colour, taste, odour and touch. The atoms are homogeneous, they are not different kinds of atoms corresponding to the elements of earth, water, light and air. These homogeneous atoms become heterogeneous by varying combinations and develop into different elements. Thus, the Jainas do not hold qualitative differences among the primary atoms. The Vaisesikas, on the other hand, hold that there are different kinds of atoms which have different qualities mentioned above. Thus, the atoms of earth, water, light and air are not homogeneous.

The Buddhists split reality into discrete and disconnected moments or point instants called ksanas, the ultimate reals. Atom, according to the

Nyaya-vaisesika also, is a mere point which has no extension in space, but speaking in terms of time, it is just the opposite of the Buddhist point-instant. Not merely has it a duration but is also eternal. Another point of difference between the two is that the atom of Vaisesika is a substance which possesses not only qualities like smell, taste, colour, touch, etc., but many universals like satta (existence), dravyatva (substanceness), prthivitva (earthness), etc., and also the differentiating entity called visesa. All these properties qualities, universals and visesa are objective entities having their essence separate from that of their substratum (atom). The atom of the Vaisesika conception, therefore, being a substance and containing those separate entities within it, would appear to be a complex object. Of course, it is not so in a physical sense because qualities, etc., although separate entities, are not material entities. Ksanas of the Buddhists, on the other hand, are conceived as dharmas (properties). Hence, the term ksana can never be used for the atom of Nyaya-vaisesika.

The Greek philosophers like Democritus and Epicurus state that the atoms are by nature in motion. But Vaisesikas believed that the atoms are by nature inactive and motionless. During the dissolution of the world, the atoms subsist without producing any effect. They then remain isolated and motionless. According to the Vaisesikas, the movement of the ultimate atoms is due to an external agent. The earlier Vaisesikas hold that the movement of the ultimate atoms arises from a peculiar dharma. Prasastapada says, "Actions which we find appearing in the rudimentary elements (mahabhiitesu), and for which we cannot find any cause either by sense perception or by inference, and which are yet found to be useful or harmful to us, must be regarded as produced by these unseen agencies (adrstakaritam)." But the unseen agencies, being unconscious, cannot combine them with one another and adjust them to the experiences of the individual souls. They cannot guide the world process and account for creation and dissolution and variety of the world. That is why the later Vaisesikas became theistic and introduced the deistic concept of God to account for creation and dissolution. God does not create atoms, ether, time, and space; they are co-eternal with Him. God produces motions in the atoms and combines them into composite products with the aid of unseen agencies or merit and demerit residing in the individual souls for their enjoyment and sufferings.

Now, when motion is imparted to atoms by God with the aid of unseen agencies, they begin to vibrate (parispanda) and immediately change into dyads (dvyanuk). The dyad is minute (anu), short and imperceptible, and is produced by the combination of two atoms. Three dyads form a triad (tryanuk) which is great (mahat), long (dirgha) and perceptible. By the conjunction of four triads, a quartrad (caturanuk) is produced. In this way, this process goes on following the law of geometrical progression and not the arithmetical progression. The quartrads are combined into larger and larger composite substances, till we have the great earth, the great water, the great fire and the great air. Thus, all physical things are produced by the combination of atoms. Creation, therefore, means the combination of atoms in different proportions and destruction means the dissolution of such combinations.

Throughout all the changes from cause (atoms) to effect (production), these atoms do not change either in number or in any other aspect. They give rise to various products which undergo changes but they themselves remain unchanged. For example, if any product is destroyed and is reduced to its ultimate particles, it will be found that the number of the atoms out of which that object was produced, remains as before. In other words, the ultimate matter remains the same throughout the entire process of change. It is also a fact that the weight of the totality of causes is equal to the weight of the particular effect produced out of these causes which means that in creation of the physical world, the law of conservation of weight holds good. The modern science has also verified the truth of this law.[68]

Chemical action is responsible for all possible changes in this physical world where earthly particles and products predominate. Only the earthly particles and products, after having come in contact with heat particles, change their qualities such as colour, taste, smell and touch.[69] These changes occur only in earth and; atoms of earth when objects come in contact with heat.[70] This course of change is known as chemical action.[71] For example, our food and drinks change their qualities as these come in contact with heat. All growth and decay are the result of chemical action. In science air conditioning and refrigeration have been devised to protect the eatables from the effect of heat.

Other substances such as water, light, and air, are not effected by chemical action.[72] It is only through contact with earthly particles that water, for instance, appears to have changed its qualities but this is not a real change. We know that water is naturally cool; it appears hot after it is boiled simply because earthly particles mixed with water have become hot due to its contact with heat. Similarly, if there appears any change in the taste, smell and colour of water, after it has come in contact with heat particles, it is due to the presence of earthly particles in water. As a matter of fact, even after being boiled, water does not give up its natural qualities such as colour, taste and touch[73] the same is the case with air. It appears hot not because of its contact with heat but because of the presence of earthly particles in it. Thus, these are not the real changes.[74]

Though the Nyaya and Vaisesika have unanimity on almost all the basic tenets of philosophical problems, yet they differ in regard to the process of chemical action. The Vaisesikas adopt the theory of pilupaka. According to this theory, there is first the disintegration of the whole into its atoms and then are integration of them into a whole. For example, when the jar is baked the old one is destroyed, i.e., resolves into atoms. The application of the heat generates the red colour in atoms, which are again, brought together and a new jar is produced. All this complicated process is beyond perception, since it takes place with extreme rapidity in an interval of nine moments.[75]

The Naiyayikas, on the other hand, advocate the theory of 'pitharapaka', by which the change of colour is effected in both the atoms and products simultaneously. This view seems to be more reasonable as, if the first jar be destroyed and a new one substituted for it, we shall not be able to identify it as the old jar. We see the same jar as before except for the difference in colour. Moreover, the Vaisesika view seems to make even the odour of the earth-atoms non-eternal. The fact that sensible things are operated on the heat shows that they are not absolutely solid but are porous.[76]

Thus, this chapter presents an analysis of the nature of the physical world according to the Joint-System. The views of the Greek philosophers and the other eminent authorities on the subject have also been incorporated wherever relevant. The views of the Joint System have been substantiated with the help of the existing knowledge of the physical sciences. The modern scientists have raised certain fallacies pertaining to the views expressed by the advocates of the Joint System regarding the nature of the physical world, which have been examined below.

The basic objection of the modern scientists is that the area covered by the Joint System is restricted in its scope and it does not propound a clear and ultimate explanation of the phenomenon of the physical world. Their contention is that the basic elements like gold, silver, hydrogen, etc., have not been accorded any place in the Joint System analysis. For example, if gold is split up, the smallest particle obtained will remain gold with all its natural properties. These particles of gold do not bear any relation with the qualities of Mahabhutas. This objection of the modern scientists levelled against the tenets of the Joint System is quite untenable. To trace the characteristics of the earth is to attempt to find the shirt in the cotton. According to the Nyaya-vaisesika system gold particles had been existing before the Mahabhutas as came into being. The evidence can be collected from the known to the unknown and the truth can be ascertained from the able work done by the learned philosophers of the Joint System. Gautama has traced the origin of this visible world from the visible causes. He argues that a body is not produced from another body-a pot is not produced from another pot and all is not the cause of all. Like produces like. A pot is produced from the pots-herds of the like material. This is the testimony of perception which is the highest evidence. It can be inferred from this experience that the causes of the gross elements of earth, etc., are the most subtle, supersensible and eternal substances possessing colour and other attributes.

The existence of such substances is thus self-revealed. The inference is from the known to the unknown. Moreover, the physical scientists do not explain the origin of the elements and admit them as the basic causes of this physical world. In the same way, the philosophers of the Joint System have visualized this world on the assumption of four kinds of 'paramanus'. They did not feel the necessity of going beyond these four kinds of 'paramanus', as the authors of this system thought it sufficient to enlighten the scholars of those days. Therefore, it is wrong to presume that the philosophers of the Joint System were ignorant beyond that stage.

The modern physical scientists take credit of having discovered the facts of this physical world which, they believe, were not known earlier. They have found the real source of energy in electrons, protons, etc., (refer to the Appendix 5.1 for details). However, they have not been able to determine the number of electrons, etc., in a particle of energy as yet. Therefore, the electrons, etc., cannot be accepted as additional basic elements. The physical scientists admit that, the atom is the smallest particle of matter that can only take part in a chemical reaction. These are only the parts of the elements and the properties exhibited by them are the properties of the elements. The Joint System points out that the atoms have unlimited energy in them. The physical sciences could discover only a little. They can know only that part of the energy in the element which has become prominent due to the will of God. Thus, in the ultimate analysis, it is the concept of element and not that of electrons, protons, etc., which is the basis of the physical sciences as electrons, etc., cannot have independent existence. Hence, the discoveries made by the physical sciences are neither an advance upon the Joint System nor are they fundamentally different from it. However, it still needs a great effort to unearth the treasure of knowledge hidden in our ancient Indian philosophical systems.

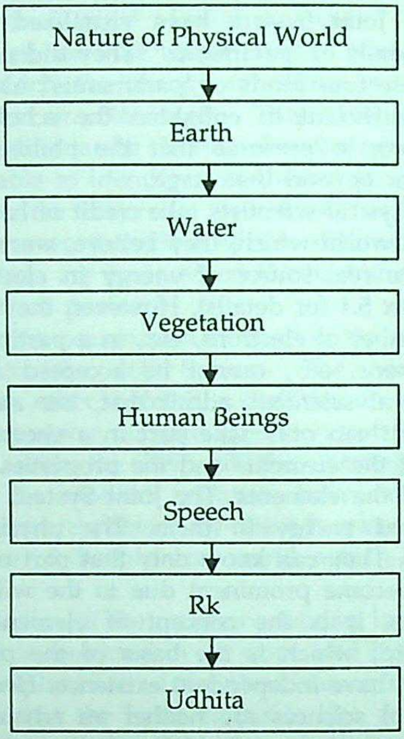
Chandogya Upanisad beautifully explains the structure of physical world (See Chart 5.3)

एषां भूतानां पृथिवी रसः पशथिव्या आपो रसः । अपामोषधयो रस ओषधीनां पुरुषो रसः
पुरुषस्य वाग्रसो वाच ऋग्रस ऋचः साम रसः साम्न उन्द्गीथो रसः ॥ 2॥

[The essence of all these beings is the earth.[1] The essence of the earth is water.[2] The essence of water is vegetation.[3] The essence of vegetation is man. The essence of man[4] is speech.[5] The essence of speech is Rk.[6] The essence of Rk is Saman.[7] The essence of Saman is Udgitha.[8]

1. The term essence has to be taken in different senses to suit the need of each statement. The earth is the 'essence' in the sense of being the support or the cause of the creation, preservation and dissolution of the movable and immovable begins.
2. Because water and earth are interwoven like warp and woof.
3. Because vegetation is the modification of water.
4. Because the body of man feeds on vegetation.

CHART 5.3



5. Because speech is the highest of all the faculties of man.
6. Because Rk is—by the organ of speech and so is a grade higher than the latter.
7. Because Saman is a grade higher, for it gives more joy to the singer and the listener.
8. Because in Om all the sounds are included. Om is to be meditated upon as the essence of all essences.]

To quote Chandogya Upanisad:

तं वा एतं देवा आत्मानमुपासते तस्मात्तेषाँ सर्वे च लोका आत्ताः सर्वे च कामाः स सर्वोश्च लोकानाप्नोति सर्वोश्च कामान्यस्तमात्मानमनुविद्य विजानातीति ह प्रजापतिरुवाच प्रजापतिरुवाच ।। 6।। इति द्वादशः खण्ड ।। 12 ।।

The attainment of all the worlds and all the enjoyments by the released soul is not to be understood like the attainment of kingdom by the king. It is just like seeing the clayas the substance of a pot (cf. Tai. 3.10.5). The statement that he attains all the objects of enjoyment being the Self of all is made with a purpose. The purpose is to extol the attainment of the knower of Brahman, who is in no way less than the worshipper of the Lord through meditation and work. The latter is known to be blessed by the Lord by the fulfilment of all his desires. The knower of Brahman also enjoys the fulfilment of desires which the worshippers get, by his becoming the Spirit dwelling in all creatures including the worshippers. This should be taken as praise of the Jnam. In fact, when ignorance is dispelled by Brahman-intuition, the Janam is no other than Brahman. If it is admitted that he has a physical existence in the realm of nature, it may also be presumed that he participates in divine enjoyments born of a pure mind. The true enjoyer is the Paramatman through the instruments of all creatures and even the empirical usage of 'enjoyer', 'enjoyment' and the rest is also an illusory transformation of that Supreme Reality.

By following the teachings of Indian philosophical system, there can be no problem of pollution in any sphere of life on this earth which is going to be a blessing of God.

Chandogya Upanisad rightly advises:

ॐ आप्यायन्तु ममाङ्गानि वाक्प्राणश्चक्षुः श्रोत्रमथो बलमिन्द्रियाणि च सर्वाणि सर्वं
ब्रह्मौपनिषदं माहं ब्रह्म निराकुर्यो मा मा ब्रह्म निराकरोदनिराकरणमस्त्वनिराकरणं मेऽस्तु
तदात्मनि निरते य उपनिषत्सु धर्मास्ते मयि सन्तु ते मयि सन्तु ॥
ॐ शान्तिः शान्तिः शान्तिः

Om. Let my limbs and speech, Prana[1], eyes, ears, vitality and all the senses grow in strength. All existence is the Brahman of the Upanisads. May I never deny Brahman, nor Brahman deny me.[2] Let there be no denial at all; let there be no denial at least from me. May the virtues that are proclaimed in the Upanisads be in me, who are devoted to the Atman; may they reside in me.

Om Peace ! Peace ! Peace !

[1. The term Prana is generally translated as breath, life-breath, vital breath, vital force, orbital energy. Though these terms convey the sense more or less in many contexts, none of these terms renders adequately the term as it issued by the Upanisads. So in this and similar other cases we have retained the original in translation, the meaning being supplied by the explanatory notes given wherever necessary.

2. Brahman actually does not deny or reject anyone, since He is all and is in all. Let me also not deny Him through ignorance so that I may have eternal union with Him.

3. Om is the symbol and representation of Brahman. It is uttered for securing all-round auspiciousness.

The repetition of 'peace' thrice is to ward-off all internal, external and heavenly causes of trouble.]

ANALYSIS

P.P. Radhakrishanan in his article, "Man and the Universe" in *Bhawan Journal* states that universe is a great mystery, it is a great plurality. Universe is a context where lie infinite potential possibilities and capabilities. Human mind always wondered at this nature and got indulged in search and intellectual investigations from time immemorial. . . . . The Vedas emphasize that the internal suksma-sacira, the subtle body of man, the 'soul' in modern thought, is of transcendental importance; and is of the nature of infinite consciousness. Let us compare this with the observation of Einstein: " we may therefore regard matter as being constituted by the recons of space in which the fields is extremely intense . . . . there is no place in this new kind of physics both for the field and matter for the field is the only reality. If there is one thing on which most scientists have agreed it is that they do not and probably never will understand the universe. Science is totally baffled by the fact that every mystery of the physical world points to a mystery beyond itself. Edison cried in despair, we do not know one millionth of one percent about anything, J.R. Oppemheimer confessed. If we ask for instance whether the position of the electronics remains the same, we must say 'No'. If we ask whether it is in motion, we must say 'No'. The reality of the atomic Phepecist, like the reality of the Eastern mystics transcends the narrow framework, of opposite and contradictory concepts. The above words seems to echo the words of the Upanisads regarding Brahman.

> It moves, it moves not
> It is fair and it is near,
> It is within all this,
> And it is outside of all this.

We can thus conclude that ancient Sanskrit literature possessed better understanding of the nature of physical world than the present knowledge of science enables us to have. The following arguments may be marshalled in support of our concluding statement:

1. Thorough Description of Physical World

Ancient Sanskrit Literature contains a detailed description of the physical world and its constituents. Science, even today has not provided the description of many constituents like manu as which is the most important to maintain this physical world.

2. Every Constituent of Physical World has been assigned its importance

All the constituents of physical world have equal importance. Exploitation of one leads to the disequilibrium in physical world. Hence, all are important.

3. All precautions have been mentioned to maintain. Environmental equilibrium

The ancient Sanskrit literatures provides the functions of every constituent and its role in the maintenance of balance in the physical world.

4. Scientific Laws made after scientific revolution confirm the structure and relationships of physical world

Ancient Sanskrit Literature was already knowing all the laws like gravitation, chemical action, through which the physical universe is governed. These laws were developed later by the sciences.

5. Atomic theory in Science was mentioned in great detail in Indian Philosophical System

Atomic theory was mentioned in great detail in the Ancient Sanskrit Literature and explained in more detail. This was only for the explanation of the physical world and not for making destructive instruments like atom bomb for the destruction of the physical world.

6. Mind has been specially mentioned as a constituent of the physical world to help in the maintenance of the equilibrium of the physical world

Mind provides discriminative quality and hence promotes good thoughts and curbs negative thinking.

7. Environment Pollution

The knowledge of science in action has damaged the quality of life on this beautiful physical world as the people used this knowledge for their own advantage while Ancient Sanskrit literature uses the knowledge based on ethics for the peaceful of Environment.

8. The actions on the principles of physical world as enshrined in Indian Philosophy can take the universe out of Chaos and Environmental degradation

The ethical principles contained in Ancient Sanskrit Literature like avoidance of greed, lust, attachment, anger can prevent the degeneration set in by the knowledge of science.

9. Human being develop positive attiudes to different constituents of environment

Human beings in Sanskrit Literature are provided with positive attitude which if acted upon can make this physical world to regain its glory.

10. People should desist from exploiting the physical world

As Ancient Sanskrit Literature make use of the physical world with great reverence. However, the knowledge of science and technology have made this a commercial venture and reduced this physical world ugly and a scar on the fair name of humanity.

Einstein expressed his sense of shock in his autobiography when he first came in contact with the reality of atomic Physics: "All my attempts to adopt the theoretical foundation of Physics to this (new type of) knowledge failed completely. It was as if the ground had been pulled out from under one, with no firm foundation to be seen anywhere, upon which one could have built." In the 19th Century, Vedas were translated into many European languages; and Schoperhauer, the German philosopher observed, "Access to the Vedas is the greatest privilege this country may claim over all previous centuries." In the whole world, he added there is no study so beneficial and so elevating as that of the Upanisads. It has been the solace of my life—it will be the solace of my death.

Today, there is a need of using science and technology with the support of the principles enshrined in Ancient Sanskrit literature about the physical world to revive its glory wherein people and all other constituents of the physical world can play their assigned role. In this way, the environment of the physical world would be harmonious where we can hear the chirpings of birds, enjoy the greenery of plants, lead a decent life on mother earth. All the problems of environmental pollution world be automatically solved and we can lead a life of decency based on ethics, dignity and natural laws.

CONCLUSION

The nineteenth century was a rather bad day for theologians. For, then science was very positive in certain findings that tended to cut away the ground from under the theologians' feet; and there was a growing fancy among the people to rely more on the verdict of science than on that of theology.

Scientists of the last century were firm in their belief that they could explain the universe with a few scores of elements and half a dozen elementary forces. According to their conception the universe is a huge machine wherein myriads of indivisible atoms are being played upon by a number of material forces. The machine is lodged, in absolute space and it works with the flow of absolute time. And the mighty law of causation is there to explain every movement of the cosmic machine. The machine moves smoothly, steadily and continuously and every step forward can be determined accurately from the previous state of things.

According to these scientists the universe is filled by ether in which lie strewn material bodies in the shape of stars and planets at distances of millions and millions of miles. In this vast ocean of space the earth is like a tiny grain of sand on the sea-shore. Evidence of life on the tiny speck of an earth made these scientists look upon life as an intruder in the realm of matter. Just as separation of the earth from the original tar or nebula, due perhaps to the attraction of an approaching star, was nothing but a pure accident—so also must have been the appearance of life on earth something like an accident. Like the magnetic property of the Iron group and the radiating property of the radioactive group of elements, life may be a property of the element Carbon that plays such an important role in the make-up of all organic tissues.

Thus, speculated the scientists of the last century on life. Such an unshakable faith did they call up regarding the ultimate nature of atoms and material forces that even philosophers did not hesitate to build up philosophical systems on these material units. They processed to explain inelegance as a by-product of chemical changes in the material contents of the brain.

Hence, search for intelligence before creation naturally became a meaningless affair, and as a matter of course theology was about to be set aside as something meant for satisfying puerile curiosity.

The birth of the new century has tilted the scientist's kaleidoscope. The vision before him has undergone a miraculous change.

Indivisible and indestructible atoms, on which the materialists of the last century relied so much, have betrayed their unsubstantial nature and the picture of the cosmic machine is on the point of tumbling down.

The atom is no longer supposed to be a compact, homogeneous and ultimate unit. A new world has been discovered in the sealed bosom of the atom. It has been found to be like a miniature replica of the solar system. A proton or a combination of protons and neutrons forms the nucleus within the immense void of an atom, and round the nucleus electrons are engaged in a whirling ring dance.

"The diameter of an electron is about one-fifty-thousandth of the diameter of an atom; that of the nucleus is not very much larger; an isolated proton is supposed to be much smaller still." So, compared with the void within an atom, the space occupied by electrons and protons is insignificantly small. As a matter of fact, if all the electrons and protons composing a human body could be packed up very closely, eliminating all the unfilled space, "the man would be reduced to a speck just visible through a magnifying glass."

So all that one regarded as most solid has dissolved objectively into tiny specks floating in void. Says Sir Arthur Eddington, "When we compare the universe as it is now supposed to be with the universe as well had ordinarily preconceived it, the most arresting change is . . . the dissolution of all that we regard as most solid into tiny specks floating in void . . . The revelation by modern physics of the void within the atom is more disturbing than the revelation by astonomy of the immense void of the interstellar space."

Then the yet more surprising fact about these tiny constituents of the physical universe is that they refuse to remain in the category of matter. The protons and electrons appear as charges of positive and negative electricity. They can very well be looked upon as "fields of force" but in no sense as particles of matter. Thus a material object, a wall or a table is mostly emptiness, and "sparsely scattered in that emptiness are numerous electric charges rushing about with great speed." There is nothing substantial about it. "It is nearly all empty space-space pervaded, it is true, by fields of force, but these are assigned to the category of 'influences' and not of 'things'."

And even these tiny specks of electric charge, which go to constitute all that we call matter, can hardly be looked upon as specks or particles. Experiments have proved that protons and electrons behave both as particles as well as waves. This is why some scientists choose to call them 'wavicles just as modern science has discovered that light radiation has a dual character, namely, undulatory and corpuscular at the same time, so also protons and electrons have been found to show unmistakable signs of an exactly similar dual behaviour. Indeed some scientists consider matter as a kind of congealed radiation. Says Sir James Jeans, "The tendency of modern physics is to resolve the whole material universe into waves and nothing but waves. These waves are of two kinds; bottled-up waves which we call matter, and unbottled waves, which we call radiation or light."

Yet the most astounding fact about the structure of the material universe is what has been discovered by Heisenberg. He holds that there is a principle of indeterminateness involved in the very constitution of nature. Position and velocity of a particle at a particular moment can never be determined accurately. "A particle may have position or it may have velocity but it cannot in any exact sense have both." If its position be accurately determined, its velocity will simply go beyond the range of precise measurement. So a proton or an electron, be it a particle, or wave, or wavicle, is something of a super physical nature, because its position and velocity appear to lie on two different planes. Evidently protons and electrons appear to lie outside the normal range of even the scientist's comprehension.

This is why Sir James Jeans states that the reality behind electrons and protons belongs to higher dimensions and all that we know of them is nothing but behaviour of shadows of that reality. And this is the stuff of which the world before us is composed. The hard and tangible universe made of indivisible and indestructible atoms has been resolved into void and shadows. According to Sir Arthu Eddington, "The external world of Physics has thus become a world of shadows. . . . In the world of Physics we watch a shadowgraph performance of the drama of familiar life."

Moreover, just as the scientist tries to approach Reality in and through the illusions of the everyday world, so does the mystic try to get near Reality in and through the illusions of the mystic world. While the physicist recoils from his four-dimensional continuum, leaving Reality in a background outside the scope of his investigations, the mystic succeeds in passing beyond the mystic world of names and forms and reaching the philosopher's Ultimate Reality. The avenue of consciousness into the spiritual world leads one through the illusions of mystic experience straight to the Final Cause. So the mystic world, though illusory from the standpoint of Absolute Truth, may be said to be closer to Reality.

Having regard to all these, science can no longer object seriously to the method of self-analysis adopted by religion and to its findings. Science and religion need no longer be looked upon as belonging to opposing camps. Rather, it may be expected that they will come closer together in the near future and pledge their amity by a hearty shaking of hands.[77]

NOTES AND REFERENCES

1. Dr. Umesh Misra, Conception of Matter According to Nyiiya-vaisesika, p. 58.
2. D.N. Shastri, Critique of Indian Realism, pp. 135-36.
3. Science has found that in the immensity of space the planet earth is hardly a space of matter. It is one of the smallest of nine planets moving around the sun, which itself is an average star among billions of stars in a cluster called the Milky Way Galaxy. (Brainerd Mears, Jr., The Changing Earth, An Introductory Geology, Ban Nostrand Company, New York, 1970, pp. 19-20). The study of the earth is called the Science of Geology. (Fagan John J.: View of the Earth, An Introduction to Geology, the City College of the City University of New York, 1970, p. 3): The Earth is composed of naturally occurring chemicals called rocks and minerals. Rocks are the larger masses which are most evident in the land around us. On closer examination it can be seen that tracks are composed of minerals. Since rocks and minerals are substances and mixtures, they have been studied by both physical and chemical means. Chemical analysis of several thousand rock samples shows that two elements, i.e., silicon and oxygen compose about 75 per cent of the materials in the Earth's crust. Adding the seven next most abundant elements, to give a total of eight, accounts for almost 99 per cent of the material in the crust. For names of the elements in order of abundance by weights, see Appendix (e).
4. Prasatapada Bhasya, p. 27.
5. *Ibid.*
6. *Ibid.*
7. The sciene of Chemistry has found that a molecule of water (H_2O) consists of two hydrogen atoms and one oxygen atom. If we analyze this composition by weight, one gram of hydrogen combines with 7.94 grams of oxygen to give 8.94 grams of water. Water is a compound and hence its properties are entirely different from its constituent parts, i.e hydrogen is a combustible gas and oxygen is a supporter of combustion while water is neither combustible not a supporter of combustion (Sees and Daube: Basic Chemistry, Prentice Hall, London, 1972, p. 308).
8. Kanada, Vaisesika Slitra, 2.2.5.
9. Prasastapada Bhasya, p. 35.
10. Kesava Misra, Tarka Bhasya, p. 20.
11. *Ibid.*, Prafastapfida Bhasya, p. 36.
12. Udayana, Laksnavali, p. 31.
13. Vyomasiv Jcarya, Vyomavati, pp. 255-56.
14. Prasastapjda Bhasya pp. 38-39.

15. Smith and Cooper, Elements of Physics, McGraw-Hill, London 1964, p. 241.
16. Hogg Johan, C.: Physical Science of High Schools, D. Van Nostrand Company, London, 1951, p. 745.
17. It has been found by science that air consists of several gases. It is a mixture and not a compound and hence its composition differs from place to place.
18. Prasastaptida Bhasya, p. 44.
19. *Ibid.*, p. 47.
20. Udayana, Kirnavali, p. 22.
21. Udayana, Kusumanjali-prakara, pp. 81-82.
22. Prasastapada Bhasya, p. 44; Sivaditya, Sapta-padarthi, p. 15.
23. Sridhara, Nyaya-Kandli, p. 737.
24. Prasastapada Bhasya, p. 44.
25. Jayanta, Nyaya-Manjari, p. 477.
26. Sadananda, Vedantasara, p. 61.
27. Udayana, Lakjajivali, p. 34.
28. Prasastapqda Bhasya, p. 58.
29. *Ibid.*
30. Vatsyayana, Nyaya-Bhasya, 2.2.13.
31. Uddyotakara, Nyaya-Vaisesika, 2.2.13, p. 280.
32. Vacaspati Misra, Tatparyalika, 2.2.13, p. 441.
33. *Ibid.*
34. Kanada, Vaisesika Slitra, 2.2 .10.
35. Prafastapada Bhasya, p. 67.
36. Sanker Misra, Vaiseṣika Upasara, 2.2.11.
37. Sridhara, Nyaya-Kandli, p. 68; Jayanta, Nyaya-Manjari, p. 141.
38. A.B. Keith, Indian Logic and Atomism, pp. 236-37.
39. Kanada, Vaisesika Sutra, 2.2.6.
    Prasastapada Bhasya, p. 63.
40. *Ibid.*, Kanada, Vaisesika Sutra, 2.2.9.
41. Prasastapada Bhasya, p. 63.
42. Sridhara, Nyaya-Kandli, p. 66.
43. Vatsyayana, Nyaya Bhasya, 2.1.38.
44. *Ibid.* 2.1.39-43.
45. Prasastapada Bhasya, p. 36.
46. Gautama, Nyaya Satya e.w. 59; Kaoada, Vaisesika Sutra, 7.1.23.
47. *Ibid.*, 3.2.2.; Prasastapada Bhasya, p. 16.
48. Jayanta, Nyaya Manjari, p. 498.
49. Kanada, Vaisesika-Sutra, 4.1.6; 6.1.2.
50. Vatsyayana, Nyaya Bhasya, 1.1.4.
51. Prasastopada Bhasya, p. 95.
52. Jayanta, Nyaya Manjari, p. 498.
53. *Ibid.*
54. *Ibid.*
55. Kanada, Vaisesika Satya, 5.2.13.
56. Prasastapada Bhasya, p. 21.
57. *Ibid.*, p. 89.
58. Gautama, Nyaya Sutra, 3.2.60-62; Vatsyayana, Nyaya Bhasya, 3.2.60-62; Kanada; Vaisesika Satya, 3.2.3.
59. Demócritus, a Greek philosopher, held that even souls are composed of atoms, while Kanada distinguished between souls and atoms and regarded them as co-eternal entities, which are not reducible to one another, each of them possessing an

ultimate individuality or particularity which distinguishes it from all other eternal substances.

60. James Jeans: The New Background of Science, the University of Michigan Press, 1959, p. 16.
61. For details of Atomic Theory in Science, refer to Appendix No. F.
62. Kanada, Vaisesika-Sutra, 4.1.2.
63. Visvanatha, Siddhtinta-Muktcivali, p. 152.
64. *Ibid.*, p. 146.
65. *Ibid.*, p. 150.
66. *Ibid.*, pp. 150-51.
67. Sankara Misra, Upaskara, 8.1.2.
68. In science, 'the law of Conservation of Mass' which corresponds to 'the Law of Conservation of Energy' states that mass is neither created nor destroyed and that the total mass of the substances involved in a physical or chemical change remains unchanged. However, in 1905, the German American physicist, Albert Einstein (1879-1955) found that mass and energy are interconvertible as expressed by the equation ($E=mc^2$) where E=energy, m is the mass and c the velocity of light. To be even more correct, the laws of conservation of mass and energy have been combined and the correct approach is that the total of the mass and the energy is neither created nor destroyed but may be transformed. (William S. Seese and Guido H. Daube: Basic Chemistry, Prentice Hall, INC, 1972, pp. 59-62.
69. Kanada, Vaisesika Sutra, 7.1.6.
70. Vyomacivacarya, Vyomava, p. 446.
71. In science, such changes in which new substances are formed and there is a change in the composition of the substance, are termed as chemical changes. For example, burning of wood, rusting of iron, etc. Whenever a chemical change occurs, a chemical action is said to have taken place. A chemical action proceeds due to some sort of chemical attraction called chemical affinity between various atoms. (P.L. Soni, Fundamental Inorganic Chemistry, Sultan Chand and Sons, 1967, pp. 15-18).
72. Udayana, Kirnavali, p. 67.
73. *Ibid.*, p. 67.
74. In science, such changes (conversions), in which the identity or the composition of a substance does not change, are called physical changes. Thus, a physical change is simply a conversion from one form of a substance to another, e.g., the changes in state of water, from ice to liquid to water are examples of physical changes.
75. Madhvacarya, Sarva-darsan-Samgraha, Ch. 10.
76. Vacaspati Misra, Tatparyaaku, p. 355; Jayanta, Nyaya Manjari, p. 438.
77. Swami Nirvedananda, Religion and Modern Doubts, Sri Ramakrishan Math, Calcutta, 1993, pp. 31-46.

CHAPTER 6

THEORY OF PADARTHAS (CATEGORIES)

Padartha means literally the meaning of a word. A padarth is an object which can be thought (artha) and named (pada). Prasastapada defines padartha as a knowable thing (jneya), or as a validity cognizable thing (prameya), or as a nameable thing (abhidheya).

6

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The approach of the Nyaya-vaisesika to the universe is purely a realistic one. It is in agreement with the actual reality and the conventions of the external world. In the words of J.C. Chatterji, "It is the stand-point of an absolute beginner; . . . an unreflecting mind who regards all the objects of the universe as real things.[2] Such objects are cognized either through the instrumentality of the external sense-organs or through the internal sense-organs. In the former case, the external objects of cognition are the specific attributes of the five mahabhutas, namely, rupa, sparsa, gandha, rasa and sabda which have enough affinity with their respective sense-organs through which they are cognized. In the later case, the objects of the sensible world are cognized through the instrumentality of the internal organs, and hence are subtler elements like paramanus, tanmatras, etc.

Gautama's Sixteen Padarthas

Gautama, in his Nyaya-sutra, proposes a scheme of sixteen categories. Out of sixteen, the second category enumerates the twelve things, which have nothing in common except the capacity of being known by one or the other of the four proofs, and Gautama treats of them only in that light. He does not mention about the nature of these things. This is the reason why Gautama's definitions of soul, cognition, mind, etc., only tell us how they are known, but say nothing as to what they are. These sixteen categories of Nyaya are not the ultimate ontological categories and do not represent an exhaustive classification of all aspects of reality. They look like headings of so many chapters in a treatise on logic, which one should study in order to master the details of Nyaya-dialectics. This is why these categories were ignored and later on, in the syncretic age, the seven categories of the Vaisesika came under the second category of nyaya-sutra.

Kanada's Seven Categories

Kanada tries to analyze the things and then lays down the final liberation which follows the right understanding of things. His method is that of generalization. He divides all the reality into six categories.[3] The seventh (non-existence) was added afterwards. Of these seven categories, the first three, i.e., substance, quality and action possess a real objective existence. The next three i.e., generality, particularity and inherence are products of intellectual discrimination (buddhyapaksam). These six categories have existence, name ability and knowability.[4] They are not subjective notions but ontological entities. The seventh category, i.e. non-existence is also an ontological category. It is not mere negation of a substance in thought, but real non-existence of a substance. When a jar is destroyed, there is a real negation of the jar.

It is to be noted that Kanada did not speak of non-existence as a separate category. Prasastapada also did not state whether non-existence should be considered a separate category. But Sridhara, Udayana, Vyomasiva and Sivaditya add the seventh category of non-existence. Sivaditya recognizes seven categories including non-existence in his work entitled 'Saptapadarthi'. Sridhara says, "Non-existence has not been mentioned separately, because it depends upon existence, not because it does not exist." Thus it is clear that Kanada proposed seven categories, though he did not mention it separately. All the modern realists like Russell,[5] Alexander[6] recognize the reality of non-existence.

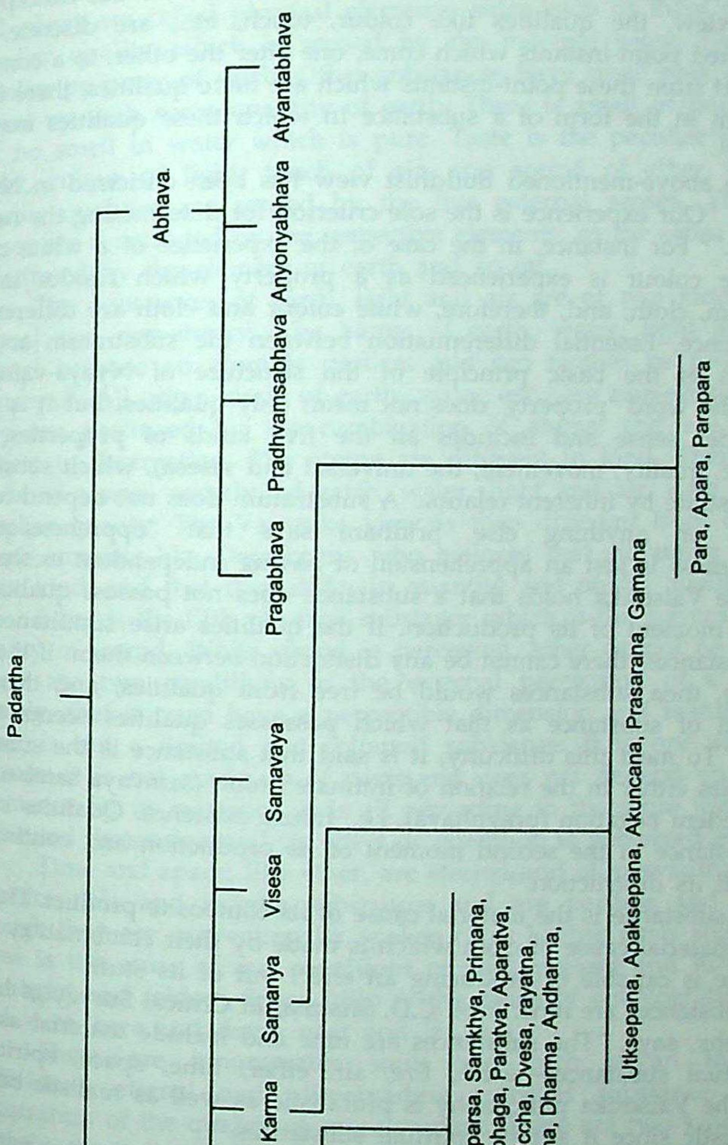
The eminent writers of the Nyaya-system also approve of the Vaisesika principle of classifying and labeling the real.[7] It is admitted by Vatsyayana that besides the twelve, there are countless other cognizables and that it is possible to classify them all under the seven heads recognized by the Vaisesika.

Now, we shall deal these seven categories in detail so as to have a clear understanding of each of them.

1. Sinstamce (dravua)

Nyaya-vaisesika school, considers that our common experience presents a world consisting of separate individual objects which are called substances. The category of substance at once unfolds the pluralistic realism of this joint system. It has been defined as 'the substratum where actions and qualities inhere and which is the co-existent material cause of the composite things produced from it.[8] In the words of prasastapada, "Substance is the main category. All categories depend on it for their existence. Substance is the substratum of all other categories. So it is first mentioned." Being the substratum of qualities, the

CHART 6.1


Padartha
Bhava
Abhava.
Dravya
Guna
Karma
Samanya
Visesa
Samavaya
Earth, Water, Light, Air, Akasa, Time, Space, Soul, Mind
Rupa, Rasa, Gandha, Sparsa, Samkhya, Primana, Prthaktva, Samyoga, Vibhaga, Paratva, Aparatva, Buddhi, Sukha, Dukha, Iccha, Dvesa, rayatna, Gurutva, Dravatva, Sneha, Dharma, Andharma, Sabda, Samskara
Utksepana, Apaksepana, Akuncana, Prasarana, Gamana
Para, Apara, Parapara
Pragabhava
Pradhvamsabhava
Anyonyabhava
Atyantabhava

substance is different from qualities. But Buddhists refute this conception. In their view, the qualities like colour, touch, etc., are discrete and disconnected point-instants which come, one after the other, in a constant flux. Apart from these point-instants which are mere qualities, there is no substratum in the form of a substance in which these qualities may be residing.

The above-mentioned Buddhist view has been criticized in Nyaya vaisesika. "Our experience is the sole criterion for determining the nature of reality."[9] For instance, in the case of the experience of a white cloth, the white colour is experienced as a property which resides in the substratum, cloth; and, therefore, white colour and cloth are different in their essence. Essential differentiation between the substratum and its properties is the basic principle of the structure of Nyaya-vaisesika system, the word 'property' does not mean only qualities, but it is used in a wider sense and includes all the five kinds of properties (i.e., substance, quality, movement, the universal and visesa), which subsist in their substrate by inherent relation. A substratum does not depend for its existence on anything else. Sridhara says that "apprehension of substanceness is just an apprehension of having independent existence."

The Vaisesika holds that a substance does not possess qualities at the first moment of its production. If the qualities arise simultaneously with substances, there cannot be any distinction between them. If they do not arise, then substances would be free from qualities, and then the definition of substance as that which possesses qualities seems to be violated. To meet this difficulty, it is said that substance is the substrate of qualities either in the relation of intimate union (samvaya sambandha) of antecedent negation (pragbhava), i.e., future existence. Qualities inhere in a substance in the second moment of its production and continue to do so till its destruction.[10]

A substance is the material cause of its composite product. Threads are the material cause of cloth which is made by their combination. Only substance is capable of producing an effect out of its stuff.

Substances are nine. Prof. C.D. Sharma, in Critical Survey of Indian Philosophy, says, "The substances are nine and include material as well as spiritual substances—earth, fire, air, ether, time, space, spirit and mind. The Vaisesika philosophy is pluralistic as well as realistic but not materialistic since it admits spiritual substances."

Kumarila regards darkness (tamas) as a distinct substance with the quality of colour, i.e., blackness, and the action of motion. The Vaisesikas point out that the experience which associates colour and movement with darkness is erroneous. For a substance having colour can be seen only in the presence of light; and darkness, which is seen in the absence of light, cannot be a substance having colour. It is said to possess the black colour figuratively, even as the colourless sky is spoken of as blue. It is a variety of non-existence, being merely the negation of light.[11] Hence darkness is not a distinct substance.

Out of the nine substances, the first five (i.e., earth, water, light, air and ether) are called physical elements, since each of them possesses a peculiar quality which is sensed by the external sense. Smell is the peculiar property of earth. Other substances have smell only as they are mixed up with some quantity of earth. There is smell in muddy water, but no smell in water which is pure. Taste is the peculiar property of water, colour of light, touch of air, and sound of ether. These five specific qualities are sensed by the five external senses. The external senses are constituted by the respective elements; as the sense of smell is constituted by the element of earth and so on.

The substances of earth, light and air are of two kinds, namely, eternal and non-eternal. The atoms of earth, water, light and air are eternal because an atom is partless and can neither be produced nor destroyed. All other kinds of earth, water, etc., are non-eternal, because they are produced by the combination of atoms, and are, therefore, subject to destruction. The atoms are different in kind. There are four kinds of atoms, namely, of earth, water, light and air, each having its peculiar quality. The Vaisesika view is thus different from that of the Greek atomists like Democritus who believes that all atoms are of the same kind, and that they differ in quantity and not in quality.

Ether is the fifth physical substance which is the substratum of the quality of sound. While sound is perceived, ether cannot be perceived. There are two conditions of the external perception of a substance, namely, that it must have a perceptible dimension and manifest colour. Ether is not a limited and coloured substance. It is one and eternal; because it is not made up of parts and does not depend on any other substance for its existence. It is all pervading in the sense that it has an unlimited dimension and its effect or operation is perceived everywhere.

Time and space, like ether, are eternal and all-pervading. They are imperceptible and infinite substances and are partless and indivisible though they are conventionally spoken of as having parts and divisions. Time is the cause of our cognitions of past, present and future and of 'younger' and 'older'. Space (dik) is the cause of our cognitions of east and west, here and there, near and far.

There are innumerable souls and each is an independent, individual, eternal and all-pervading spiritual substance. It is the substratum of the quality of consciousness. There are two kinds of souls, namely, the individual soul and the supreme soul. The latter is one, and is inferred as the Creator of the world. The former is internally or mentally perceived as possessing some quality when, for example, one says, 'I am happy', 'I am sorry', and so on. The individual self is not one but many, being different in different bodies.

Mind is regarded as an internal sense. It is atomic, many eternal and imperceptible. Each self has a mind. It is the organ through which the self comes into contact with the objects. Its existence is inferred from the fact that the self must perceive internal states of cognition, desire and conation through an internal sense, just as it perceives external objects through external senses. Moreover, in the perception of external objects the mind is selective and active. We do not perceive colour, touch, taste, smell and sound simultaneously, even though all the external senses may be in contact with their objects. It can come into contact with one sense only at one time.

2. *Quality (Guna)*

A quality cannot exist independently by itself like substance. It inheres in a substance which is its substrate. It is non-material cause of things insofar as it determines only their nature and character, but not their existence. All qualities must belong to substances and so they have themselves no qualities. Kanada defines it as "that which has substance for its substratum, has no further qualities, and is not a cause of, nor has any concern with conjunction or disjunction." He mentions seventeen qualities, viz., colour (rupa), taste (rasa), smell (gandha), touch (sparsa), number (samkhya), size (parimana), individuality (prthaktva), conjunction (samyoga), disjunction (vibhaga), priority (paratva), posteriority (aparatva), knowledge (buddhi), pleasure (sukha), desire (iccha), aversion (dvesa), and effort (prayatna). Prasastapada adds seven more which are heaviness (gurutva), fluidity (dravatva), viscidity (sneha), (samskara). Some add lightness (laghutva), softness (mrdutva), hardness (kathinatva) to the twenty-four qualities. But these are not separate qualities since lightness is only the absence of heaviness, softness and hardness represent different degrees of conjunction.[12]

The qualities that belong to eternal substances are called eternal, and those of transient ones, non-eternal. Those that subsist in two or more substances are said to be general, while those residing in only one substance are said to be specific. Number, magnitude, distinctness, conjunction, disjunction, remoteness, nearness, derived fluidity, gravity and velocity are general qualities, while colour, taste, smell, touch, viscidity, natural fluidity, knowledge pleasure, pain, desire, aversion, effort, merit, demerit, faculty and sound are special qualities which help to distinguish objects which possess them from others.[13]

Qualities are divided into (i) those which can be perceived through one external sense-organ, viz., colour, taste, odour, touch and sound, and (ii) those that can be perceived through two external sense-organs, eyes, and the skin, viz., number, magnitude, distinctness, conjunction, disjunction, remoteness, nearness, fluidity and viscidity, and (iii) those that cannot be perceived through any sense-organ, viz., gravity, merit, demerit, and faculty.[14] The qualities of the self, e.g., cognition, pleasure, pain, desire, aversion and volition are perceived through the mind (manas).

Colour (rupa), a special quality perceived by the visual organ, only resides in earth, water and light, though in the two latter the colour is permanent. In earth it varies when heat is applied. There are seven kinds of colour, viz., white, blue, yellow, red, green, brown and variegated (citra).

Taste (rasa) is the special quality of things apprehended only by the gustatory organ. Earth and water have taste. The tastes of earthly substances are due to the application of heat and are of six kinds, viz., sweet, sour, salty, pungent (katu), astringent (kasaya) and bitter. The taste of water is sweet and not produced by the application of heat. It is eternal in atoms of water.

Odour (gandha) is the specific quality which is apprehended by the olfactory organ only. It resides in earth only and is of two kinds, viz., fragrant and the reverse, i.e., bad smell.

Touch (sparsa) is the special quality which is apprehended only by the tactual organ. It resides in earth, water, light and air. There are three kinds of touch—hot, cold, neither cold nor hot. This shows that touch is regarded as temperature. Water is cold, light is hot. Earth and air are neither cold nor hot. It is transient in earth. It is eternal in atoms of water, light and air, but transient in their composite products.[15]

Sound (sabda) is a specific quality perceived by the auditory organ only.[16]

Number (samkhya) is a generic quality (samanyaguna) of things by virtue of which we use the terms one, two, three, etc. Of these numbers, unity (ekatva) is eternal in eternal substances and transient in transient substances, while other numbers are non-eternal only.

Magnitude (parimana) is the specific cause of measurement. There are four kinds of magnitude, viz., minuteness, largeness, length and shortness. Ether has extreme largeness (paramamahattvam) and an atom has extreme minuteness (parimah dalya). The dimension of non-eternal substances is determined by the number, magnitude and arrangements of the parts composing them.[17] Dyads are minute, while the rest are of limited magnitude.

Individuality (prthaktva) is the basis of distinctions among things.18 It is real and objective. It is eternal in substances and transient in transient substances.

Conjunction and disjunction refer respectively to the union of things which are separate and separation of things which were in union. Conjunction effects only parts of the things conjoined. It is destroyed by separation or by the destruction of things conjoined. Disjunction subsists in two substances disjoined. It is of three kinds, (i) due to the movement of one of the things disjoined, e.g., the flying away of a kite from a fixed pole, (ii) due to the movement of both things disjoined, e.g., moving away of two wrestlers fighting with each other, (iii) and due to another disjunction, e.g., separation of a body from a tree due to disjunction of hand from a tree.

Remoteness and proximity are the basis of the notions of 'remote' and 'near'. Each of them is of two kinds, spatial and temporal. Prasastapada does not regard remoteness and proximity as ultimate qualities of things, but as relative to each other depending on the relating activity of thought.

Knowledge, pleasure, pain, desire, aversion and effort are the qualities of the soul.

Knowledge is the manifestation or apprehension of objects. It is a quality of the self. Knowledge is mainly of two kinds: valid knowledge and invalid knowledge. Valid knowledge is of four kinds, viz., perception, inference, comparison and testimony. Invalid knowledge is of four kinds, viz., doubt, illusion, indefinite knowledge and dream.[19]

Pleasure is an agreeable feeling produced by the intercourse of the sense-organs with desirable objects. Pleasure is not mere negation of pain; it is a positive feeling of enjoyment.

Pain is a feeling of injury to the self. It is a feeling of self-abasement.

Desire is a craving for the attainment of an unattained object by oneself or by another person. It arises from recollection of an object that yielded pleasure in the past.

Aversion: In aversion, self flies into a rage which arises from pain and recollection of painful objects. It is the cause of effort, remembrance, merit and demerit.[20]

Effort is that activity which leads to the attainment of desirable and to the abandoning of the undesirable.[21] It is of three kinds, namely, pravrtti or striving towards something, nivrtti or striving away from something, and jivanayoni or vital function.

Gravity (gurutva) is the quality of things by which they tend to fall to the ground.[22] Falling is due to gravity, when conjunction, velocity, or effort is absent. It exists in earth and water. It is eternal in atoms of earth and water, transient in the products.

Fluidity (dravatva) is the cause of flowing. It exists in earth, water and light. It is natural in water. It is caused or derived in earth and light. Gold and butter become fluid in contact with fire.[23]

Viscidity (sneha) belongs to water, and is the cause of cohesion, smoothness, etc.[24]

Merit (dharma) and *demerit (adharma)* are qualities of the soul by virtue of which it enjoys happiness or suffers misery. Merit is the effect of the performance of the enjoined duties and demerit is the effect of the commission of forbidden acts. Merit and demerit are imperceptible. They are inferred from the body and other organs of enjoyment and suffering, which are brought about by merit and demerit. They are not brought about by effort. Merit and demerit are also known from the authority of the scriptures.

Faculty (samskara) is of three different kinds: velocity (vega),[25] which keeps a thing in motion (it exists in earth, water, light, air and mind); mental impressibility (bhavana), by which the soul is able to remember and recognize things already experienced, and elasticity (sthitisthapaka), by virtue of which a thing reverts to its original state even when it is disturbed. Elasticity is the quality of the substances which contract and expand.[26]

These are twenty-four qualities of substances. "The Vaisesika classification of qualities into twenty-four kinds is guided by these considerations of their simplicity or complexity, and reducibility or irreducibility. These qualities are what the Vaisesika thought to be the simplest, passive qualities of substances.[27]

3. *Karma (Motion)*

Kanada defines motion as that which resides only in one substance; is devoid of qualities; and is the direct and the immediate cause of conjunctions and disjunction.[28] Motion resides in a substance like a quality, but it is its temporary feature, whereas a quality is its permanent feature. Conjunction, which is a quality, resides in many śubstances, which are conjoined with each other, but motion is present in one substance only. For example, conjunction of a book with a table resides in two substances, while the motion of a fan resides in it only.

Motion is devoid of a quality. It is destroyed by conjunction. Motion is an unconditional cause of conjunction[29] and disjunction.[30] For example, the motion of a vehicle is the direct and immediate cause of its disjunction from one part of the ground and conjunction with another part of it. The vehicle, which is a substance is the inherent cause of its disjunction from one part of the ground, and of its conjunction with another part of it. But its motion is their non-herent cause.

All motions must subsist in corporeal substances such as earth, water, light, air and the mind. There can be no movement of incorporeal substances, i.e. akasa, time, space, soul, because these cannot change their position.

A motion is incapable of producing another motion.[31]

If a motion produces another motion, then when a man moves there should not be the stoppage of his motion; for, every motion will go on producing another motion of its own type ad infinitum. If it be held that the movement of the man would come to an end when the desire to move further and the effort to that effect are stopped, then we should say that the cause of the subsequent motions is the desire and the effort and not the motion itself.[32]

An action does not produce any substance. The reason is that at the time of the production of a substance, motion does not exist. It disappears just after the production of the subsequent conjunction.[33]

I. Kinds of Motion

Taking direction as the basis of classification, the Nyaya-vaisesika system has distinguished the following kinds of motion:

(i) utksepana
(ii) Apaksepana

(iii) Akuncana
(iv) Prasarana
(v) Gamana.

(i) *Utksepana* is the cause of the contact of a body with some higher region, e.g., throwing a ball upward. This is due to weight, effort, and conjunctions.[34]

(ii) *Apaksepana* is the cause of the contact of a body with some lower region, e.g., throwing down a ball from a house-top.[35]

(iii) *Akuncana* is that kind of motion by which the upper parts of an extended substance are disjoined with those parts with which they were connected before and are combined with the parts at the bottom; so that the substance becomes curved,[36] e.g., clinching of the fingers.

(iv) *Prasarana* is that kind of motion by which the upper parts of a substance become disjoined with the parts of the same substance at the bottom and become connected with the upper parts with which they were disconnected before; so that, the object becomes straight, e.g., opening one's clenched hand.[37]

(v) *Gamana:* Whatever type of motion is not covered by the varieties mentioned above is referred to by the generic term gamana, which, therefore, implies motion in general. Gamana embraces different kinds of motion as rotatory motion (bhramana), going up of flames, flowing down of liquids, falling down due to weight, etc.

2. Causes of Motion

A body is intrinsically static and is supposed to be set in motion by some quality present in it.[38] Motion is produced by (i) weight, (ii) effort, and (iii) conjunction.[39] Prasastapada adds (iv) fluidity to the above. (v) Samaskara[40] and adrsta[41] also produce motion.

(i) Weight

It is defined as the cause of the falling motion, e.g., a fruit from a tree. The force of weight is counteracted by volitional effort, as when a flying bird keeps itself from falling down; by contact, as when a bird's nest is supported by the branch of a tree; and by the impulse, as when an arrow flies on transversally for some time before dropping down on the ground.[42]

(ii) Effort

It is of two kinds—one which proceeds from life and other that proceeds from desire and hatred. Of these, the former is the cause of vital-airs, namely, prana and apana. This action occurs while a man is sleeping. The other is the cause of the activities which are capable of leading to the desired end of removing the undesired, e.g., the movement of one's hand for taking food, or for striking an enemy.[43]

(iii) Conjunction

Motion due to conjunction is produced by forcible contact[44] or by impulsion.[45] Forcible contact is the cause of that motion which causes disjunction between that object which strikes against another object and vice versa.[46] On the other hand, impulsion is the cause of that motion which produces the non-disjuction of the impeller from the impelled.

(iv) Fluidity

It is the cause of the motion of flowing.[47] It belongs to earth, water and fire. It is natural in water alone, while it is extrinsic to earth and fire. The fluidity belonging to snow, ice, hailstone, etc., is due to the contact of the earthly tejas, as it is in the case of gold.[48] The extrinsic fluidity belonging to earth and tejas is produced by the contact of tejas. For instance, in the case of butter, honey, etc., a motion is produced by the contact of the tejas helped by velocity in the paramanus which constitute them.

(v) Samskara

It is also a cause of motion. It is of three kinds, viz., velocity, elasticity and mental impressibility. Out of these three, only first two are the cause of motion. Velocity is produced by motion with the help of impulsion, forcible contact and other causes, in all the five kinds of substances possessing limited forms, namely, earth, water, fire, air and manas.[49]

Elasticity exists in tangible substances of which the constituent parts are very closely combined together. It brings back the substance to its original position, if that substance had changed its position otherwise, on some other occasion.[50] We find its effects in bow, branch of a tree, horn, tooth, bone, thread, cloth and the rest which are subject to contraction and expansion.[51]

(vi) Adrsta

Such motions which cannot be explained through ordinary causes mentioned above, are attributed to the adrsta, i.e., unseen force, which is mainly due to merit, or demerit, or both. The first motion of atoms on the eve of a fresh cosmic creation, the upward motion of the flames of fire, the transversal motion of air, the movement of an iron-needle towards the magnet, etc., is said to be by adrsta. In all these cases, the operation of adrsta is assumed because of the belief that no empirical causes can be ascertained by any of the accredited instruments of knowledge.[52]

These causes sometimes operate separately, independent of any other cause and sometimes they join together to produce one joint effect.

3. Motion as an Object of Perception

Motion, according to Kanada, is visually perceived when it inheres in a visually perceivable substance. Sanker Misra adds that motion is the object of tactual perception as well, provided it belongs to a tangible body. There is, therefore, no possibility of perceiving the motions of atoms or of minds.

There is an old view, recorded in the Mahabhasya, according to which there is no such objectively real thing as motion; what is called motion is only a conceptual construction to explain the fact of one's reaching a particular place and thus having contact with it. Prabhakara, though a realist, was in all probability influenced by this old theory of motion. For according to him, motion is under no circumstances an object of perception. We perceive only the moving body and the successive conjunctions and disjunctions that its motion produces. The presence of motion in the body is inferred from these conjunctions and disjunctions.[53]

The Bhatta Mimamsakas and the Vaisesika adopt more or less the same line of argument to refute the Prabhakara view. When a moving body comes to be conjoined with or disjoined from certain points of space, the conjunctions and the disjunctions must have both the body and the space as their substrates. If, therefore, motion is to be inferred from these conjunctions and disjunctions, it must be inferred as belonging to the body as well as the space. This, however, is an obvious absurdity, for it is the body alone that moves, and space by its very nature is incapable of motion. Conjunctions and disjunctions thus do not constitute the valid logical ground for the inference of motion in a perceived body. Such motion should be supposed to be an object of direct perception.[54]

4. Generally (Samanya)

The category of generality was accepted by the Vaisesikas to explain the notion of commonness in the objects of class. Individual jars, through different entities, but as they all produced a similar cognition, they were designated by a common name 'jar'. Kanada regards generality as a conceptual product. He defines generality and particularly as mental concepts, i.e., they depend upon the intellect.

There are two aspects (general and particular) of every object. The same property may be general in relation to one class and particular in relation to another. For instance, in the case of a jar, the universal dravatva residing in it is general in relation to Prthivitva, but it is at the same time particular in relation to the universal satta. Uddyotakara expressly says: "Every object has got two aspects, the general and the particular." Sridhara says: "When we have the notion of commonness, we cognize the universal dravatva, etc., but when we have the motion of differentia, we cognize the individual substances, earth, etc."

Prasastapada regards the generality as eternal and residing in many things belonging to the group of substance, quality or action. But it is an interesting point that Prasastapada himself says that one of their common properties is that they are indicated by intellect. Explaining this Sridhara says, "If somebody doubts the existence of generality, etc., there is no other proof of their existence except through the intellect. In the case of the first three categories, substance, etc., the proof of their existence may be provided by their effects also; but this is not possible in the case of the last three categories."

Prasastapada held that generality performed both the functions, viz., that of causing the notion of commonness and also that of differentiation. He supposed that they were generals primarily, and particulars in a secondary sense. The function of differentiation having thus been assigned to generality, the term 'visesa' was restricted to the ultimate particulars. Thus, Prasastapada paved the way for the generality being assigned an objective reality. Being regarded as objectively real, the generality was also conceived as eternal. Hence, Prasastapada was the first to hold generality to be objectively real and eternal, but it is probable that the idea might have existed some time earlier, because, as Randle has pointed out, the Nyaya-sutra of Gautama already speaks of generality as eternal and perceptible by a sense-organ. This clearly implies acceptance of the theory of objective reality of generality. However, it is clear that while Kanada insisted more on the activity of thought and therefore the inseparable relation between the universal and the individual, Prasastapada shifts the stress to the eternal nature of the universals.

The Buddhists are not in favour of the above-mentioned nature of generality. According to them, the individual alone is real and there is no universal other than the particular objects of experience. It is only the name that is general, and the name does not stand for any positive essence that is present in all the individuals. Certain animals are called cow, not because they possess any common essence but because they are different from all animals which are not cows. So there is no universal but the name with a negative connotation.

The Jainas and the Advaita-Vedantins adopt the conceptualistic view of the universal. According to them, the universal does not stand for any independent entity over and above the individuals. The universal and the individual are related by way of identity. The universal has existence not in our mind only, but also in the particular objects of experience. It does not, however, come to them from outside and is not anything like a separate 'essence', but is only their common nature.

But the Nyaya-Vaisesikas enunciate the realistic theory of the universal. According to them, universal is a real entity which corresponds to a general idea or class-essence in our mind. Annambhatta defines universal as one, eternal and inhering in many individuals. There is the class-essence of man in all individual men. It is one, though the individuals in which it inheres are many. It is eternal, though the individuals in which it inheres are born and die. It is common to many individuals. We know individual men as belonging to the same class because there is the same class-essence of man in all men. Some of the modern realists like Russel also hold that a universal is an eternal timeless entity which may be shared by many particulars.

The generality subsists in substances, qualities and actions.[55] Jarness of jar subsists in individual jars which are substances. Colourness of colour subsists in individual colours which are qualities. The class-essence of movement subsists in all individual movements which are actions.

The universal does not subsist in another universal. If there were such a universal, it would have another universal and so on. So, in order to avoid infinite regress, the universal subsisting in another universal is not recognized. All individual cows have the same essential qualities because the same class-essence subsists in them all.

The universal exists in each individual wholly. It can never-exist partly, because it has no parts. When a particular individual comes into existence it comes to be related to the universal. "Though the universal is eternal, its relation to a particular individual comes into existence only at the moment when the individual comes into being."[56]

The universals have been distinguished in three classes according to their scope, viz., highest, or lowest, and the intermediate.[57] "Being-hood" is the highest universal.[58] It includes all, and is not included in anything. The genus of jar is the lowest universal present in all jars, since it has the most limited extent. The genus of substance as another universal is intermediate between the highest and the lowest. It is wider in relation to substances like earth, water, etc., and narrower in relation to the universal 'being-hood' which belongs to substance, quality and action.

A distinction is also made into jati and upadhi. The jati of a thing is inborn, natural and eternal, while upadhi is adventitious and transitory. Every common characteristic is not a jati. Since some persons are blind, we cannot have a jati of blindness. If it were so, blind men, blind cows and horses would be grouped under the same class. Humanity distinguishes human beings from other animals, but blindness does not differentiate blind men from blind cows. So, the classification of men as human beings is a jati, while their grouping according to blindness is an upadhi.

There cannot be generality where there are conditions. These conditions have been described by Sanker Misra as under:

(i) Abheda

Generality inheres in many individuals. If there is only one individual, it can have no generality inhering in it. Ether is one individual substance. So there is no genus of etherness.

(ii) Tulyatvam

Potness and pitcherness are not two different classes because they are co-extensive. They are two different names of the same class.

(iii) Samkara

If there is a cross-division between two classes, they cannot be recognized as true universals. Four kinds of atoms (i.e., earth, water, fire and air) and ether are physical substances while the four atomic substances and the mind are corporeal substances. Ether is physical but not corporeal. Mind is corporeal but not physical. So physicality and corporeality are not generalities, because they involve cross-division.

(iv) Anavastha

No generality can subsist in another generality since it would lead to infinite regress.

(v) Rupahani

Generality cannot subsist in particularities since it would contradict their nature. Generality is inclusive; particularity is exclusive. So particularity absolutely refuses to allow of inherence of generality in it.

(vi) Asambandha

Since there is no relation of inherence between that generality and inherence so there is no generality of inherence.

5. Particularity (Visesa)

According to Vaisesika the true realization of the Atman, the highest end of Indian philosophy, is possible by the right knowledge of each and every category accepted by the system. This is possible only when every object is distinguished from its homogeneous and heterogeneous classes. Everything in this world is differentiated from another on account of different attributes, different qualities and different universals. But in the case of two objects (e.g., two jars) which have not only the same universal but, being quite similar, have the same qualities, the question arises how one of them can be differentiated from the other. The obvious answer is that they are differentiated on account of the difference of their parts. But what about the two atoms of the same class, say of earth, which have the same universal and the same qualities, and which have no parts. How can one atom be differentiated from another of the same class? If they are not differentiated, they will coalesce and form one mass; and the atomic theory of the Vaisesikas will come to an end. The Vaisesika seeks to explain the position by contemplating that each atom possesses an ultimate differentiating characteristic called particularity by means of which it is distinguished from all other atoms. What is true of atoms is also true of other eternal substances (e.g., akasa, kala, dik, atman and manas).

Kanada defines visesa as the ultimate distinguishing feature of an eternal substance, which is known by its discrimination from the other eternal substances. It depends upon the intellect to indicate its existence. Prasastapada also defines particularity as the ultimate distinguishing features of eternal substances. They are called visesas, because they are the causes of the ultimate distinction of their substrates from one another. They are the final distinctive character of eternal substances.

From the definitions of particularity accepted by Kanada and Prasastapada, we may say that Kanada believed that particularity was an aspect of every object which caused the notion of its differentiation from other objects. Though the term 'antya-visesa' occurs in the Vaisesika-Sutra also, it is not explained there. The theory of visesa as differentiator of atoms, which is the corner-stone of the atomic theory, is not found in the Vaisesika-Sutras. The atomic theory is usually supposed to be associated with the Vaisesika school. The name of the founder of the school, Kanada, meaning an atom-eater, also seems suggestive of the same. The category visesa being intrinsically associated with the atomic theory, it has also been suggested that the name of the system; Vaisesika, might have been derived from it. But this is not probable, because the theory of visesa in that sense, as pointed out above, is not found in the Vaisesika-Sutras. On the other hand there is reason to believe that the doctrine of visesa, in the sense of particularity has been accepted in the Vaisesika-Sutras, which is an important principle of that school. It is possible that the name of the school might have been due to the term 'visesa' used in that sense.

Prasastapada makes particularity an objective reality. He restricted the term 'visesa' to the sense of ultimate particulars residing in eternal atoms and other eternal substances. Particularity inheres in each of them, which distinguishes it from the other eternal substances. Particularities are held to be eternal because we cannot conceive of any eternal substance remaining in differentiated from others at any time. Particularity is thus an independent self-sufficient principle of differentiation. It is the unique feature of a single individual, and so its only function is to differentiate. It is ultimate in the sense that it functions even when every other means of differentiation fails. Thus, Prasastapada introduced the theory that the term visesa is exclusively used in the sense of antya-visesa residing in the atoms and other eternal substances. In later Nyaya-Vaisesika literature, especially in the manuals like Tsrka-bhasya, Nyaya-Siddhanta-Muktavati and Tarka Samgraha, the use of the term visesa in the above mentioned sense continued.

This antya-visesa does not belong to the qualities and motions possessed by eternal substances; for the differentiation in those cases is possible through the help of their own intermediate jatis, namely, suklatva, raktatva,[59] gamantva, etc., and also through the visesas of the form of their substrata.[60]

Particularities do not require other particularities to distinguish them from one another, because it would lead to infinite regress. They distinguish themselves from one another.[61] Thus, they perform a double function. Firstly, they distinguish the eternal substance from other eternal substances, and secondly, they distinguish themselves from other particularities.

There cannot be any class-character like 'visesatva' common to all particularities.[62] They exist in single substances only. Sivaditya supports this view as: "Visesa is an entity inhering in a single substance, and devoid of a community."

The Neo-Naiyayikas headed by Raghunatha Siromani deny the logical necessity of acknowledging particularity as a distinct category. They hold that if particulars can distinguish themselves from other particularities without the aid of other particularities, then atoms themselves may distinguish themselves from other atoms without particularities inhering in them. The Vedantins and the Mimassakas, Kumarila and Prabhakara also do not accept particularity as an independent category. They ask how one particular visesa is differentiated from another visesa. To this Prasastapada replies: "Cognition caused through the agency of a thing relates to things other than itself. For instance, a lamp causes the cognition of a jar, etc., but the cognition of a lamp is never brought about by another lamp. Just as the flesh of a cow and that of a horse are unclean by themselves and their contact defiles other things also, similarly, in the cases of visesas differentiation being their nature, they are differentiated by themselves, and by their contact atoms are also differentiated."

Moreover, Prasastapada believes that yogins are able to perceive the ultimate particularity of the simple substances. It may be argued that the yogins can distinguish them from one another by dint of their merits born of meditation without the aid of their particularities. But this argument is invalid. Just as they cannot perceive a white thing as non-white, and recognize a thing never perceived before by dint of their own merits, so they cannot distinguish the atoms of the same kind from one another by dint of them without the aid of particularities. If they could distinguish them from one another without particularities inhering in them, their perceptions would be invalid. The Vaisesika system advocates realistic pluralism. It recognizes the category of visesa as an independent category to emphasize the individuality of eternal substances. Visesa, according to Vaisesika, is a distinct type of real and cannot be brought under any other category. It is not substance, because it is not the substratum of quality; nor is it quality or action, for it does not participate in a universal. It is manifestly not a relation and so cannot be identified with inherence. Each particularity inheres only in one eternal substance and is, therefore, not a universal, which is supposed to be related to many individuals (substances, qualities or actions). Mutual non-existence cannot serve the purpose of visesa. Mutual non-existence exists in two entities, which have dissimilarities. There is a mutual non-existence of a cloth and a jar in each other. But particularities exist in two eternal substances, which have similar qualities, and distinguish them from each other. So mutual non-existence cannot serve the purpose of particularities. Therefore, the existence of particularities must be admitted to account for the ultimate distinction of eternal substances.

6. Inherence (Samavaya)

The category of inherence plays a very important part in upholding pluralistic realism of the Nyaya-vaisesika. 'Cloth is white'; in this cognition, whiteness appears as an entity separate from the cloth in which it is experienced as residing. Again, there must be some device to unite these two components, i.e., cloth and whiteness. That device was conceived in the form of inherent relation.

The function of inherence is to relate two entities which are inseparable. Thus, not only are there two separate objective entities, cloth and whiteness; there is, besides them, a third entity the relation between them. It is necessary to relate a substance to its quality, action, generality and particularity which are all real. If the first five categories, i.e., substance, quality, action, generality and particularity are the bricks the Nyaya-vaisesika structure, the mortar to unite them is provided by this sixth category of inherence.

The category of inherence explains the Nyaya-vaisesika conception of causality as a new emergence. The effect is different from its material cause, in which it does not exist before its production. The effect resides in its material cause by inherent relation. It is for this reason that material cause is designated in the Nyaya-vaisesika system as the 'samavayl-karana', i.e., the cause which contains its effect within it by samavaya relation. The samavaya relation is thus the basis of the Nyaya vaisesika theory of causation.

Kanada defines inherence as "that which produces in respect of cause and effect the notion of this being contained in that."

From the above definition, it seems that the conception of samavaya at first originated in connection with the relation of cause and effect, because Kanada does not speak of qualities, movements or universals to be residing in their substances by inherent relation. But after Kanada, the scope of inherence was extended to the subsistence of qualities, movements or universals, and later on, when a separate category 'visesa' was formulated, it was also held to be residing in atoms or other eternal substances by the same relation. Prasastapada defines inherence as the relation which subsists among inseparable things, which related to one another as the container and the contained; and which is the basis of the idea 'this is in that'.

According to this definition, the two entities necessarily stand in the relation of the container and the contained. That which cannot exist without the other is always the contained, and the other which can exist independently is always the container. The second feature of the definition is that inherence subsists in inseparable things. It is not the relation between two entities, which are capable of separate existence. The whole and the parts, quality and substance, action and substance, generality and the individual, particularity and an eternal substance, are inseparable things. The whole inheres in the parts; quality inheres in substance; an action inheres in a substance; generality inheres in an individual; particularity inheres in an eternal substance. Inherence is one eternal relation.[63] It is one, because it has the same distinguishing feature. There is no evidence of its distinctions.[64] One inherence can account for all notions 'this subsists in this abode'. So it is useless to assume many inherences. Though inherence is only one, there is a restriction due to the differences of the substrates and their contents. The genus of substance inheres in substances. The genus of quality inheres in qualities. The genus of action inheres in action.[65] Thus, though inherence is one, it has a restriction as to its substrate and its content due to the differences in the power of being the manifester and the manifested.[66]

Inherence is eternal, since all positive products are produced in their material cause by the relation of inherence, and if inherence is produced, it will require another inherence, and so on *ad infinitum.* So in order to avoid infinite regress, inherence is regarded as eternal. Sivaditya defines inherence as an eternal relation. Just as one Being inheres in many existing entities, so one inherence subsists between innumerable pairs of relata. Just as Being is eternal, so inherence is eternal. Inherence is different from conjunction, which is a temporary relation.

Dr Radhakrishnan regards inherence as an internal relation. He says, "Conjunction is external relation, while inherence is internal relation. In conjunction, two different are joined together without forming a real whole which enters into each. Inherence is a real coherence." But in the view of Prof. J.N. Sinha; "It is misleading to regard inherence as an internal relation. An internal relation is one which enters into the being of the relata and constitutes their nature. The relata cannot exist apart from each other. An internal relation implies mutual dependence of the relata on each other. But we know that whole cannot exist apart from its parts, but parts can exist apart from the whole; a quality cannot exist apart from a substance, but a substance can exist apart from a quality, an activity cannot exist apart from a substance, but a substance can exist apart from an activity, an individual cannot exist apart from a generality, but a generality can exist apart from an individual. So only one term of the relation depends upon the other. There is no mutual dependence of the members of the relation on each other. So inherence may be regarded as an intimate or necessary relation, not an internal relation." Prof. Hiriyana regards inherence as an external relation. In our view, inherence should be regarded as an eternal relation, since one of its term can exist apart from the other. In this relation, only one terms depends upon the other and is inseparable from it. There is one-sided dependence in it. In internal relation both the terms should depend on each other. There should be mutual dependence of both the terms of the relation in an internal relation. But this is not in case of inherence. Hence it cannot be called an internal relation, but it should be called an external relation.

The Nyaya-vaisesika holds that inherence does not require any other relation for its subsistence. It subsists by itself. If it be by some other relation, that will lead to a process of infinite regress. Sridhara also remarks: "It does not subsist in an object. Being itself in the nature of a relation, it subsists in an object by itself (without the need of any other relation)."

About the perception of inherence, there is a difference of opinion among Nyaya and Vaisesika, Nyaya school holds that inherence is perceptible, while the Vaisesikas deny it. The Nyaya system accepts six kinds of contacts and holds that any object, substance and non-substance, comes in contact with the senses by any of the first five forms of contact, and if there resides in that object any non-existence as its attribute, the non-existence is perceived by the sixth form- of contact, i.e visesana-bhava. Inherence is also an attribute of the object in which something resides by that relation, and that samavaya also, like non-existence, is perceived by the sixth kind of contact. Kesava Misra maintained, while describing the sixth kind of contact, that inherence was also perceived through (visesa-bhava) contact.

The Vaisesika school held inherence to be merely inferable. According to this school, inherence is not perceivable. The relation between a rose and its colour is not perceived. It is inferred from the notion 'this subsists in this abode'. Visvanatha says that inherence is inferred from the qualified cognition of a substantive, an attribute, and relation between them. A jar is endued with a colour. The jar is a substantive; colour is an attributive. Inherence is the relation between them. The jar and its colour are perceived. But inherence between them is not perceived. Prasastapada says, "Inherence is imperceptible, because it has no relation of subsistence, as is found in the universal existence which resides by inherent relation in the objects that are perceptible."

Inherence is different from substance, quality, action, generality and particularity, because it is a relation between a substance and the other categories.[67] It is different from non-existence. So it is a distinct category.

Sankara criticizes the theory of inherence. He holds that if cause and effect are inseparably connected; as the Vaisesika admits, then it is far simpler to assume that there is identity of essence between the two. Kumarila also holds: "If inherence is something different from the class and the individual, then it could not exist in them as a relation; on the other hand, if it be identical with them then these two could be identical by the law that things that are identical with the same thing are identical with themselves." Vaisesika system has refuted this misunderstanding. According to it the two inseparable entities, which are related through inherence, do not produce the cognition of one thing. They produce two different cognitions, which apprehend them. The cognitions have different contents. They are not really one and the same thing. Therefore, inherence is not essential identity, but the relation between two inseparable entities.

Inherence is not svarupa-sambandha. If there is a svarupa-sambandha between a jar and its colour, the jar itself is the relation of colour to it. Therefore, an infinite number of svarupa-sambandha must be assumed to account for the relation between countless substances and their qualities and actions. This will contradict the law of parsimony of hypotheses.[68] Further, the assumption of svarupa-saṃbandha between a material cause (parts) and its effect (whole) would undermine the Nyaya-vaisesika doctrine of Asatakaryavada. The effect is a new beginning, which is different from, and inheres in, its material cause. The whole is different from its parts. It inheres in its parts. Therefore, inherence is not svarupa-sambandha.

Inherence Distinguished from Conjunction

There are two main relations recognized in the Nyaya-vaisesika philosophy. These are conjunction and inherence. The first is a temporary, accidental and non-eternal relation between the two things (e.g. a pen and an inkpot). The pen and the inkpot existed apart from each other before their conjunction and will exist apart from each other after they are separated from each other. But inherence is a necessary, uncaused and inseparable relation. It is a relation between a substance and a quality, a substance and an action, a genus and an individual, an eternal substance and its particularity, a whole and its parts.[69] Secondly, conjunction exists between two substances which can be separated, whereas the inherent relation exists between the entities which cannot be separated. A man and a stick which are related by conjunction can be separated but of the cause and the effect which are related by inherent relation, the effect cannot be separated from its cause, i.e., a cloth cannot exist independently of threads. Thirdly, in inherence the two entities necessarily stand in the relation of the container and the contained, but in the case of conjunction, the two substances connected by it are not necessarily in the relation of the container and the contained. In the instance of 'the fruits in the basket', there does exist the relation of the container and the contained, but in the instance of the 'two connected sticks' that relation does not exist; one of them is not the substratum of the other. Fourthly, conjunction is produced and destroyed by disjunction. But inherence is uncaused and indestructible.[70] Inherence is one while conjunctions are many. Inherence is imperceptible while conjunction is perceptible. Inherence is a distinct category, while conjunction is a quality of conjoined things. Inherence is a natural and inseparable relation while conjunction is an adventitious and separable relation.[71]

7. Non-existence (abhava)

The category of non-existence is absolutely necessary for the Nyaya-vaisesika philosophy of realistic pluralism. Nyaya-vaisesika system holds that every experience has its counterpart in the external world. When we see a piece of ground without a jar, we experience the absences of the jar in that place. Similarly, when a jar is destroyed, there is the experience of its destruction, i.e., its non-existence. This experience must have its counterpart in the external world, i.e., non-existence of the jar should have an objective reality. Because the non-existence of the jar is not unreal like a hare's horn or a sky-flower, the non-existence of the jar is the reality of a negative kind. If things simply exist and do not become non-existence, then all things should be eternal. Again, also the metaphysical conception of the Nyaya-vaisesika system is based on the theory of the reality of non-existence. The causal theory of the Nyaya-vaisesika is also based on the reality of non-existence. Kanada does not directly mention non-existence as an independent category. But he indicates it with its four kinds as a possible object of knowledge. Sanker Misra interprets the aphorisms as referring to prior non-existence, posterior non-existence, mutual non-existence and absolute non-existence. Prasastapada also had no idea of the theory of the objective reality of non-existence. Udayana holds, "Non-existence is a distinct ontological category. But it is not separately mentioned because it is indicated by the six categories of existence, which are its counter-entities."

The clear-cut idea of the non-existence as an 'objective reality' occurs in the "Nyaya-Vartika" of Uddyotakara in connection with the discussion on the sense-object-contact. It is stated there that inherence and non-existence are perceived through the sixth contact called visesana-visesya-bhava. This statement of Uddyotakara is possible only if non-existence is accepted as an external objective reality. But Sivaditya introduced it as a separate category. The very title of Sivaditya's work 'Sapta-padarthi' indicates that he wrote it with the object of establishing seven categories in place of the original six. The syncretic Nyaya-Vaisesika treatises like 'Tarkasamgraha', 'Nyaya-siddhanta-muktavali', 'Tarka-Kaumudi', 'Tarkamrta', 'Tarka-bhasa' and 'Tarkika-raksa', hold non-existence to be a distinct category.

The Vaisesika, being a realist, believes that just as knowledge is different from the object known which exists independently of that knowledge and necessarily points to some object, similarly, knowledge of the negation is different from the thing negated and necessarily points to some object which is negated. In the words of Dr Radhakrishnan, "Though an empirical classification of existent things has no need for an independent category of non-existence, still the dialectical representation of the universe requires the conception of negation. When the Vaisesika enlarged its scope and attempted to give a coherent account of experience as a whole, it developed the category of non-existence."

Udayana divides the categories into existence and non-existence.

He divides the former into substance, quality, action, generality, particularity and inherence; and the latter into prior non-existence, posterior non-existence, absolute non-existence and mutual non-existence. Sridhara and Sivaditya also recognize these four kinds of non-existence. The manuals of syncretic Nyaya-vaisesika school divide non-existence into two kinds, namely, samsargabhava and anyonyabhava. Samsargabhava means the absence of something in something else. Anyonyabhava means the fact that one thing is not another thing. Samsargabhava is of three kinds, namely, pragabhava, dhavamsabhava and atyantabhava.[72]

(i) Pragabhava (prior non-existence)

It is the non-existence of an effect in its material cause before its production, e.g., the non-existence of the cloth in the threads before its production. It had no beginning, but it had an end. It was brought to an end, when the cloth came into existence. Thus, prior non-existence is not produced but destroyed. If it is not destroyed the effect cannot be produced. This is the basis of the theory of causation asatkaryavada accepted by Nyaya-vaisesika system.

(ii) Pradhvamsabhava (posterior non-existence)

Posterior non-existence is produced by the destruction of the thing e.g. when a jar is destroyed, it has posterior non-existence. The non-existence cannot itself be destroyed, i.e. it is said to have a beginning, but no end.

(iii) Anyonyabhava (mutual non-existence)

It is the non-existence of one thing as another which is different from it. A jar is not a cloth. Here there is mutual non-existence of the jar and the cloth.

(iv) Atyantabhava (absolute non-existence)

Absolute non-existence is the absence of a connection between two things in the past, the present and the future. Colour did not exist in the air in the past, does not exist in the present, and will not exist in the future. So there is absolute non-existence of colour in the air.[73] Sridhara says: "Absolute negation is denial of an absolutely non-existent entity, which is not limited by space and time, but which is only conceived by the intellect." Absolute non-existence is different from mutual non-existence. Mutual negation is denial of identity between two things, which have specific natures. But absolute negation is denial of an absolutely non-existent entity in all times and in all places.[74]

The above mentioned four kinds of non-existence are necessary for the realistic pluralism of Nyaya-vaisesika. Sridhara says that if there were no prior non-existence, an effect would not be produced, if there were no posterior non-existence, there would be no destruction of an effect, if there were no mutual non-existence, there would not be different things with specific natures and if there were no absolute non-existence, all things would exist always and everywhere. The same idea has been expressed by Dr. Radhakrishnan[75] also. Prior negation is limited by production of an effect in future. Posterior negation is limited by its existence in the past. Mutual negation is negation of identity between two things at present, which is its counter-entity. It is limited by their specific natures. Absolute negation is non-existence of relation, which is not limited by any time.[76]

The Nyaya-vaisesika system holds that non-existence not only possesses an objective reality, but it is also directly perceptible by the senses like all other eternal objects. The cognition of non-existence depends upon the cognition of its counter-entity.[77] A jar is the counter-entity of the negation of the jar. The non-existence of a jar on the ground is perceived. Sridhara says, "When vacant ground is comprehended through sense-contact, there also occurs the cognition of non-existence in the form the ground is without a jar. That being the case, why should the cognition of non- existence be not held to be a sense-perception like that of the ground itself. Jayanta holds the same view: "When we open our eyes, we perceive the ground as well as the non-existence of the jar, but when we close them, we do not see either. Both the cognitions being, thus, equally consequent on the same phenomenon (opening of the eye), there is no reason to make the distinction that cognition of the ground should be held to be a sense-perception and that of the non-existence to be non-sense-perception." Non-existence is held to be the attribute of the ground which is connected with the sense, and, therefore, the contact is called samyukta-visesa-bhava-sannikarsa, i.e., the contact in the form of an attribute of the object which is connected with the sense.

The Mimamsakas of the Kumarila school point out that, although the non-existence of a jar and the ground seem to be simultaneously cognized by the senses, the former cannot be a sense-object, because "firstly, it is devoid of colour which is a necessary condition of visual perception and secondly, it can have no contact with the senses."[78] Jayanta rejects these points. With regard to the first point that non-existence has no colour, Jayanta says: "To be perceptible by the eye depends on being the object of cognition produced by the eye, and not on possessing colour. Although atoms possess colour, they are not perceptible by the eye." Similarly, the objection regarding the sense-object-contact, Jayanta says: "The principle of senses reaching an object (or cognizing it) applies only to positive objects. The non-existence being negative, the eye can produce its cognition even without having a contact with it." Thus, the two usual conditions of visual perception are not applicable to the perception of a negative object.

The Mimamsakas of the Prabhakara school discard altogether the theory of the reality of non-existence. They hold that if non-existence were a reality, then the negation of non-existence also must be another reality, and so on *ad infinitum.* To avoid this infinite regress, the ancient Nyaya maintained that the negation of a negation was equivalent to the positive. The modern Nyaya repudiates this view and holds that a negation can never be equivalent to a positive, but it admits that the negation of the negation of the first negation is equivalent to the first negation.[79]

The Vedantins also reject the category of non-existence. They regard it as simple substratum and nothing more. Negation is identical with its locus. The Vaisesika urges that if negation of a jar were identical with the ground, then the non-existence of the jar would be perceived even on the ground on which the jar exists. But Vedanta rejects this view. It says that negation of a jar is identical with the mere ground, which is different from the ground on which the jar exists. Absolute negation of a jar on the ground refers to the mere ground, which is a positive entity. A positive entity is called a negation in relation to another positive entity. So there is no negation. The Vaisesika thinker Madhava Sarasvati urges that negation is a distinct category. If negation were non-existent, the notion and use of 'non-existence' would be devoid of an object. He asks the Vedantins what is meant by the mere ground. If it is the ground unrelated to anything, then the ground on which a jar exists also would be spoken of as negation of the jar. If the mere ground is the ground which is the locus of negation, the negation is admitted. If the mere ground is the ground which is different from the ground with ajar, then also negation is admitted. There can be no knowledge of an entity being different from the ground with a jar without the knowledge of its being the locus of its negation. Therefore, negation must be admitted as a distinct category to account for the knowledge and use of non-existence.[80] Visvanatha urges that negation exists in a locus, which is its abode. The relation of an abode (adhara) and a content (adheya) between the locus and negation is possible only if they are distinct from each other.

Thus, the above mentioned seven categories of the Vaisesika-system represent an exhaustive classification of all aspects of reality. All these categories have been treated in this system in the most natural way so as to satisfy the common-sense of man and be in agreement with the actual reality and the conventions of the external world (vyavahara and pratiti).

NOTES AND REFERENCES

1. Prasastapada, Padarthadharma Samgraha, p. 16.
2. J.C. Chatterji, Hindu Realism, p. 10.
3. Kanada, Vaisesika-sutra,, 1.1.4.
4. Prasastapada Bhasya, p. 16.
5. Russell, The Analysis of Mind, pp. 275-76.
6. Alexander, Space, Time and Diety, pp. 200-22.

7. Visvanath, Siddhanta Muktavali, p. 41.
8. Kanada, Vaisesika-sutra, 1.1.15.
9. Vacaspati Misra, Nyaya Vartikatatparyatika, 2.1.36.
10. Sanker Misra, Upaskara, 1.1.5.
11. Kanada, Vaisesika-sutra, 5.2.19-20; Madhavacharya, Sarvadarsana Samgraha, ch. 10.
12. M.R, Bodas, Tarka Samgrahadipika, text section, p. 5.
13. Prasastapada, Padarthadharma Samgraha, pp. 95-96.
14. *Ibid.*, p. 96.
15. Kesava Misra, Tarka Bhasa, p. 24; M.R. Bodas, Tarka Samgraha, pp. 155-56.
16. However, sound in science means a mechanical wave motion in an elastic medium. (Shortley and Williams, Elements of Physics, Prentice Hall, INC, 1961, p. 460.)
17. Kanada, Vaisesika Sutra, 5.1.8-9.
18. *Ibid.*, 5.2.2.
19. Prasastapada Bhasya, pp. 172, 186.
20. *Ibid.*, p. 263.
21. *Ibid.*
22. Kanada, Vaisesika Sutra, 5.1.7-18; 5.2.3. According to Sir Issac Newton, gravity is merely a special case of gravitation and it is the force of attrac- tion exerted by the earth on all bodies lying on or near its surface. The value of gravity (g) can be ascertained with the help of this formula:
    $g = GM/(R + h)^2$ where M is the mass of the earth, R is its radius, h is the height from which the body is falling and G is constant. Bomford, G. (Oxford), Encyclopaedic Dictionary of Physics, Pergamon Press, Oxford, 1961. pp. 502-04.
23. Prasastapada, Padarthadharma Samgraha, p. 263. "The Physical properties of a substance that enables it to flow." Webster's Seventh New Collegiate Dictionary (Indian Edition).
24. Prasastapada, Padarthadharma Samgraha, p. 266. In science "viscidity (viscosity) of a fluid really expresses the resistance it offers to shearing stresses. If a pressure acts to shift laterally successive layers in a substance over each other; such a movement, if produced, is called a shear; the pressure or force producing it is called a shearing stress," Shackel, R.G., 'Concise Physics', Longman's, 1958, p. 156.
25. Velocity in science has been defined as the rate of motion of a body along a particular direction or the time rate of displacement. Merchant F.W. et. al. Elements of Physics for Canadian Schools, The Copp Clark Company, Toronto, 1937, p, 94.
26. Kesava Misra, Tarka Bhasa, pp. 27-28.
27. Chatterji & Dutta, All Introduction to India Philosophy, p. 269.
28. Kanada, Vaisesika-sutra, 1. 1. 17. The branch of Physics that deals with motion is known as Mechanics. According to this branch, a body is said to be at rest when it does not change its position with respect to its surroundings. If, however, there takes place a change in the position of the body with respect to its surroundings, it is said to be in motion. Greene Earnest, S., Principles of Physics, Prentice-Hall, I.N.C., 1962, p. 59-61.
29. *Ibid.*, Prasastapada, Padarthadharma Samgraha, p. 290.
30. Kanada, Vaisesika-sutra, 1.1.19.
31. *Ibid.*, 1.1.11.
32. Sridhara, Nyaya Kandli, p. 291.
33. *Ibid.*
34. Prasastapada, Padarthadharma Samgraha, p. 291.
35. *Ibid.*
36. *Ibid.*
37. *Ibid.*, p. 292.
38. Kanada, Vaisesika Sutra, 1.1.19. Sir Issac Newton, in 1686, propounded the three

laws governing the motion of the bodies in general, which bear resemblance to that of Kanada view. Newton's First Law states that every body in this universe continues in its state of rest or of uniform motion in a straight line unless it is compelled by some external force to change that state. This inability Oil the part of the body to change by itself its state of rest or the uniform motion in a straight line is sometimes called inertia and for this reason, the First Law of Motion is called the Law of Inertia. His Second Law states that the rate of change of momentum (man x velocity) is proportional to the external force (man x acceleration) and takes place in the direction of the force. His Third Law states that to every action, there is an equal and opposite reaction. Shortley and Williams, Elements of Physics, Prentice-Hall, INC, 1961, pp. 52-69.

39. *Ibid.*, 1.1.29.
40. *Ibid.*, 5.1.17.
41. *Ibid.*, 5.1.15.
42. Sanker Misra, Upasakara, 5.1.7.
43. Kanada, Vaisesika-sutra, 5.1.1.
44. *Ibid.*, 5.1.3.
45. *Ibid.*, 5.1,10.
46. Sridhara, Nyaya Kandli, p. 305.
47. Kanada, Vaisesika-sutra, 5.1.4.
48. Sridhara, Nyaya Kandli, p. 266.
49. *Ibid.*, p. 267.
50. It has been defined in science as:

    "Elasticity is the property of matter by virtue of which it recovers from deformation produced by force." Saunder A. Frederick and Kirkpatrich Paul, College Physics, Henry Holt and Company, New York (Fourth Edition), p. 116.
51. Prasastapada, Padarthadharma Sanigraha, pp. 266-67.
52. Sanker Misra, Vaisesika Upaskara, 5.1.15.
53. Salikanatha Misra, Prakaranapancika, p. 79. In Mechanics (the branch of Physics), Absolute Motion is the motion of a body with respect to another body whose position in space is absolutely fixed. But since there is no such body in the universe, absolute motion cannot be realized. Thus, absolute rest and absolute motion are unknown to us. We know only of relative rest and relative motion. Michels and Patterson, Elements of Modern Physics, D. Van. Nostrand Company, INC, London, 1951, pp. 33-35.
54. Sridhara, Nyaya Kandli, p. 195; Parthasarthi Misra, Sastradipika, p. 71.
55. Kesava Misra, Tarka Bhasa, p. 28.
56. J.N. Sinha, Indian Psychology, Perception, p. 185.
57. Prasastapada, Padarthadharmasamgraha, p. 11; Sivaditya, Sapla Padashi. p. 5.
58. Kanada, Vaisesika-sutra, 1.2.4, 1-10.17.
59. Sivaditya, Saptapadarthi, p. 12.
60. Jankinatha, Nyaya-siddhanta-manjari, p. 122.
61. Prasastapada Bhasya, pp. 321-22.
62. Udayana, Kirnavali, p. 25.
63. Prasastapada Bhasya, p. 324; Annam Bhatta, Tarkasamgraha, p. 95,
64. Prasastapada Bhasvya, p. 326.
65. *Ibid.*, p. 327.
66. *Ibid.*, Saptapadarthi, p. 40.
67. Prasastapada Bhasya, p. 326; Sanker Misra, Upaskara, 7.2.26.
68. Visvanatha, Siddhanta-muktavali, pp. 85-86.
69. Prasastapada Bhasya, p. 324.
70. *Ibid.*, p. 326.
71. Sridhara, Nyaya-Kandli, p. 326.

72. Visvanatha, Bhasapariccheda and Muktavali, p. 12; Kesava Misra, Tarka-Bhasa, p. 29; Annam Bhasa, Tarka-samgraha, p. 89.
73. Kesava Misra, Tarka-Bhasa, p. 29.
74. Sridhara, Nyaya-Kandli, p. 230.
75. Dr S. Radhakrishnan, Indian Philosophy, Vol. II, p. 221.
76. Udayana, Laksanavali, p. 13.
77. Sivaditya, Saptapadarthi, p. 40.
78. Jayanta, Nyaya-manjari, Vol. 1, p. 48.
79. A.B. Keith, Indian Logic and Atomism, p. 206.
80. Midhava Sarasvati, Mit Bhasini, pp. 76-77.

CHAPTER 7

CONCEPTION OF SOUL (ATMAN)

The Nyaya-vaisesika system divides reality into self (cetan) and non-self (acetan). The latter aspect of reality has been widely explained in the last chapters. Now, for the clear understanding of the nature of the physical world, it its also very necessary to know something about the nature of cetan aspect of the phenomenal world, which is generally known as Atman. Nyaya-vaisesika, representing the realistic school of thought, believes in the existence of a conscious element without whose help this objective world cannot exist. In every kind of product, whether individual or collective, the necessity of a conscious agent cannot be gainsaid. This conscious active element according to Nyaya-vaisesika, is either the Jivatman (Individual Soul) or the Parmatman (Supreme Soul). In accepting the entites, the joint-system totally depends upon the Vedic texts. Hence, both of these are separately treated under Section A and Section B respectively.

7
CHAPTER

Conception of Soul (Atman)

SECTION A: JIVATMAN (INDIVIDUAL SELF)

Proof in Support of the Existence of Individual Self

The existence of individual self is proved in Nyaya-vaisesika system through direct perception, inference and authority. Now, to begin with the first means, Kanada holds that the term 'I' in the expressions . . . 'I am happy', 'I am sorry', 'I know', etc., is an object of perception. This 'I' naturally refers to Jivatman and not to any material object like body, sense-organ, manas, etc. The opponent may raise an objection here against the implication of the term 'I' in the above expressions; for the term 'I' in the expression, 'I am fat', 'I am beautiful', 'I am blind', etc., really refers to either body, or a sense-organ.[1] To this it may be said in reply that as the objection of the opponent is based on the false identity of the body with the Atman, it has no weight. The substratum of the term 'I' is 'Atman' alone, while in other cases it is due to wrong notion,[2] and false imposition. Udayanacarya and other Naiyayikas hold that Jivatman is an object of direct individual perception.

There are direct sruti passages to prove the existence of Individual Self. But the sruti will not convince the unbelievers like the Buddhists; they adduce inferences to prove the existence of it. So says Gautama, in his Nyaya-Sutra, that desire, hatred, effort, pleasure, pain and consciousness are the various probans to prove the existence of Ataman. Kanada adds the vital airs—prana, and apana, the closing and the opening of the eye-lids, state of living, the movement of manas and the affections (vikara) of the other sense-organs to the above mentioned probans of Gautama.

Now, desire, etc., being qualities, cannot exist without a substratum. Then, in as much as it is known that the qualities, which belong to the physical organism, etc., continue as long as the physical organism, etc., exist; and as desire, etc., are not found to be so, they cannot be regarded as qualities belonging to the physical organism.[3] Again, it is a fact of common experience that there exists desire, which has been defined as a wish for attainment of something not already obtained.[4] This desire is produced in a man for the attainment of an object which had been the source of pleasure to him in the past. This means that desire supposes some permanent self who possesses consciousness and is identical with that which had experienced pleasure from certain objects in the past and which considers a present object to be similar to any of those past objects, and so strives to get possession of it. Physical organism, neither being conscious nor being an unchanging element, cannot be the required substratum. Recognition is not possible in physical organism. Sense-organs also cannot be the substratum of desire; for it is not necessary for a single sense-organ to be both the desire and the experience of the past. For instance, when a man perceives a mango and desires to have it, we cannot say that the visual organ which perceives the fruit at present also possesses the experience of the good taste of the fruit. Again, manas, being accepted as a sense-organ and an instrument, cannot be the substrate of desire.[5] Just as the experience of one man cannot be remembered by another man, so the body or the senses which are really series of different physiological states and stages, and the mind or the empirical self, which is admittedly an aggregate of different momentary physical states and processes, cannot explain the phenomena of desire, aversion, volition, pleasure, pain and cognition.[6]

As from the motion of a chariot the existence of a guiding agent, in the shape of a charioteer, is inferred, so also from the activity and cessation from activity appearing in the physical organism which have the capacity of acquiring the desirable and avoiding the undesirable, the existence of an intelligent guiding agent for the body is inferred. This conscious agent is no other than the Ataman.[7]

The presence of the variegated functioning of the vital airs in an organism proves the existence of a conscious agent in the organism who acts like the blower of the wind-pipe.[8]

From the regular action of the opening and closing of eyelids, the existence of a conscious agent in an organism, who would act like the pulley of the pulley, is inferred.[9]

From the fact that the wounds of an organism are healed up, we infer the existence of a conscious agent who would be like the master of the house repairing it.[10]

From the action of manas towards the contact of the sense-organs apprehending desirable objects, we infer the existence of an agent, who would be like the boy in a corner of the house throwing a ball to another ball stuck in the ground.[11]

When we see an object through the organ of sight, we recall the taste of that object (experienced before), we find a certain change appearing in the organ of taste. From this also we infer the existence of a single guiding agent of the two activities, like a person looking through many windows.[12] From all these proofs, it is evident that individual self exists.

Nature of the Individual Self

In India, soul is generally accepted as an eternal and permanent principle. All orthodox schools agree that soul is essentially pure and it is never affected by any kind of worldly impurities. There is, however, no universal agreement among the different schools of Indian philosophy regarding the noumenal (a ground of phenomena that is unknowable by the sense but is conceivable by reason) character of the Atman. The Carvakas adopt the materialistic conception of the self. They hold that the self is the living body with the attribute of consciousness. The Bauddhas reduce the self to a stream of thought or a series of cognition. Like some empiricists and sensationists, they admit only the empirical self. The Advaita Vedanta takes the self as one, unchanging and self-shining intelligence (svaprakasa caitanya), which is neither a subject nor an object, neither the 'I' nor the 'me'.

The Nyaya-vaisesika, however, adopts the realistic view of the self. According to this joint school, the self is a unique substance, to which all cognitions, feelings, and conations belong as its attributes. It is unconscious in itself. It is an adventitious quality of it. All cognitions or conscious states arise in the self when it is related to the manas, and the manas is related to the senses, and the senses come in contact with the external objects. The term 'consciousness' (jnana) in this joint-system is synonymous with intellect (buddhi) and apprehension (upalabdhi).[13] But the Samkhya and the Yoga regard buddhi as an unconscious modification of prakrti, the root-evolvent, in which the conscious self, it is intelligized, as it were, and appears to be conscious.[14] But in the Nyaya-vaisesika system, buddhi is apprehension or consciousness of objets. It is not an unconscious substance; it is the quality of the self. This non-recognition of the identity between self and consciousness constitutes an important feature of Nyaya-vaisesika realism. This is due to the fact that the Nyaya-vaisesika philosophy has recognized from the very beginning a distinction and not 'tadatmya' between the thing and its quality. 'Jar' as a substance is different from its red colour as well as 'jarness' which is its essence; and both of them are related to it by the relation of inherence. The self as knower is also the substance in which the essence atmatva inheres. It is only when the soul comes in contact with the body and mind that qualities like knowledge, desire, aversion, pleasure and pain arise in it. Thus, in Nyaya-vaisesika system, consciousness is a quality of the or the means as the Carvakas hold. As we have seen, consciousness is the quality of the self. Since consciousness is a quality, it requires a substance to support it. The body cannot be the substrate of consciousness, since it is not found in the dead body. If consciousness were a property of the body, it would exist in the various parts of the body and its material constituents.[15] If consciousness is a property of body then it must be capable of being perceived by others also.[16] The material causes of the body are unconscious, so the body must be unconscious. Again, the body is continually becoming new. The body of childhood is not the same as the body of the youth, and the body that one has in his old age is different from the body that he had in his childhood. If consciousness is a quality of the body, then it also will change constantly and, therefore, there will be intermittent breaks in the continuity of conscious life, which in turn will impair memory.

The sense-organs also are not the substrates of consciousness. Even when they are destroyed, there is a recollection of objects perceived through them in the past.[17] Further, they are the instruments of knowledge, and cannot be the knowing agents. It is the self who controls them, and synthesises their contributions.[18] It is the self that confers unity on the various kinds of apprehensions. The eye cannot hear sounds nor could the ear see visions, and the consciousness that I who am seeing a thing now also have heard of it, will not be possible if the soul were not different from and beyond the senses. Again, being only products of matter, the sense-organs cannot have consciousness as their property.

The mind also cannot be the substrate of consciousness. Mind is an atomic internal organ. If the consciousness had been a property of the mind, then it would also have been atomic and, therefore, non-perceptible in nature, which really is not true. If consciousness is a quality of mind, then the simultaneous cognition of things such as yogis have would be inexplicable.[19]

Thus, the self cannot be identified with the body, senses, and the mind, since it is present even when the body is lost, the senses are cut off and mind is quieted down.[20] All these belong to the object side, and can never be the subject while self is subject.[21]

The self is not a stream of consciousness as the Buddhists hold. It is not a series of momentary cognitions, for then memory, becomes inexplicable. No member of a mere series of cognitions can, like a bead of the rosary, know what has preceded it or what will succeed it. It is not a mind-body complex. It is a permanent substance in which consciousness inheres. The self is the inherent cause of consciousness, though it is produced by a collocation of condition.

The self is not transcendental consciousness beyond the distinction of subject and object, as the Advaita Vedanta holds. There is no such thing as pure intelligence unrelated to some subject and object. Intelligence cannot subsist without a certain locus. Hence the self is not intelligence as such, but a substance having intelligence as its attribute. The self is not mere consciousness or knowledge, but knower, an ego or the 'I', and also an enjoyer. The self is the perceiver of all, the experience of all pleasures and pains, and the knower of the thigns.[22] Desire, aversion, volition, pleasure, pain and cognition are all qualities of the self. The substance to which these qualities belong cannot be made up of parts, for it is an assumption of the Nyaya-vaisesika system that compound substances are destructible while simple ones are eternal. The soul is partless and eternal. It is simple. Therefore, it is indestructible. It has neither origin nor end. It is neither created nor destroyed by God.

The self is all-pervading. It cannot have a limited magnitude, since what is limited has parts and is, therefore, destructible. It is not atomic as Ramanuja holds. If it were atomic, it could not have consciousness in connection with the whole body, and could not perceive its qualities, since qualities of atomic substances are imperceptible. It cannot be of intermediate magnitude. It cannot be larger or smaller than the body. If it were so, it could not occupy the body and pervade it. It cannot be co-extensive with the body as the Jainas hold. If it were so, it would be too small for the body which grows and develops. Again, a human soul could not transmigrate into an ant's body or an elephant's body. Hence, the self is all-pervading. But it cannot apprehend many things simultaneously owing to the atomic nature of the mind, which is its internal organ. Each soul has one manas which persists throughout its empirical life. It is separated from the manas in the state of liberation.

The soul is an eternal entity which is, from time to time, connected with a body suitable to its desert. The unseen power in the soul (adrsta) generated by action done in the previous birth organizes a body for the self, appropriate to it. The organism assumed by the transmigration of soul is a fit medium for the maturation of merit and demerit acquired by it in the previous birth. The soul transmigrates into a body fit for the experiences it has to undergo. Pre-existence and future life are not so much proved as assumed. The new-born infant's desire for milk is due to experience in the previous birth. His pleasures and pains also are due to the same cause. His smiles and cries are not mere reflex actions. They are conscious action determined by experience in the previous birth.[23] If there is no pre-existence, there is gain of unmerited fruit. If there is no future life, there is loss of merited action.[24] Inequalities in the present birth are attributed to merit (dharma) and demerit (adharma) acquired in the previous birth. Actions done in the present birth will be rewarded and punished in the future birth. Pre-existence and future life are based on these ethical considerations. The self persists as a simple, eternal substance in the midst of a cycle of births and deaths. Its association with body is called birth. Its separation from body is called death.

Plurality of Individual Soul

According to Nyaya-vaisesika, there is a unique self in each body. Hence, there is an infinite number of souls. The plurality of soul is inferred from the variety of experience and conditions of different souls. Some are happy while others are miserable. Some are bound while others are liberated. These differences in the status of individuals prove the existence of many souls.[25] If there were not the plurality of soul then the bondage of one would lead to the bondage of others, and the liberation of one would lead to the liberation of others. Each soul reaps the consequences of its own actions, and hence some are happy while others are in pain.

The Advaita Vedanta, on the other hand, holds that the difference in the status of individuals can be accounted for by the plurality of empirical selves (jivatman), though the ontological self (atman) is one. The self is one, but the empirical selves limited by ignorance (avidya) are many. Sridhara asks: To whom does avidya belong? Does it belong to Brahman or to the jivas? Brahman is by nature eternally pure and enlightened, and cannot, therefore, be subject to avidya. If the jivas are subject to avidya, then there is mutual dependence. The jivas depend upon avidya for their very existence, since they are Brahman or eternal consciousness limited by avidya. Avidya abides in the jivas which are subject to it. This is mutual dependence. The Advaita Vedanta may argue that there is beginningless series of seeds and sprouts causing each other. Sridhara contends that individual seeds are causes of individual sprouts, which are causes of other seeds, which are real, but that avidya and jivas are not ontologically real, which cannot, therefore, be related to each other by mutual casualty. If the jivas are assumed to be ontologically real and eternal like Brahman without origin and end, then monism of Advaita Vedanta is undermined. If there is one ontological self, then the variety of individual experiences cannot be accounted for. Hence, the plurality of finite souls must be admitted.

SECTION B: PARAMATMAN (SUPREME SELF)

Indian though-record begins with the Vedas. In them there are definite statements regarding God and His nature. At first the ideas were polytheistic. But this polytheism soon developed into henotheism[26] (i.e., each God being elevated in turn to the position of the Supreme Deity). Henotheism in due course evolved into monotheism,[27] which culminated in monism.[28] So, the idea of the Absolute of later though had germinated already in the minds of the Vedic seers.

In the Upanisads, we find more definite statements regarding the being and nature of God. The main current of Upanisadic thought flows towards a monistic conception: 'There is one without a second'; 'All this is Brahman'. This conception of God has been called the nirguna aspect. 'He is devoid of all attributes.' Nothing can be positively postulated about Him. He can be indicated only by 'not this, not this'. But side by side with this there is another current of thought. This is the conception of God as the ruler of the universe. He is the source of everything. He is the creator and destroyer.[29] He is endowed with all virtues (gunin) and with omniscience. He is the cause of bondage and liberation.[30]

From the Upanisads to the Indian philosophical systems is not a far cry. What was in an embryonic state in the Upanisads appeared in fully developed forms in the philosophical systems. Attempts have been made either to prove or to disprove the existence of God in the orthodox and heterodox systems. The Carvakas believe only in perception as the valid means of knowledge. Merit, life after death, heaven, hell, soul and God are not objects of perception. If any God is at all to be postulated, then the visible king who is known to everybody should get the appellation.

According to the Buddhists, a thing that has nowhere been perceived cannot exist. As God has not been perceived by anybody anywhere, He does not exist, But still, Buddhism had to concede to the inborn weakness of the common man for an object of worship and support. Thus, it ended by incorporating Buddha as the supreme and central figure of a divine hierarchy. The historic Buddha was considered in the Mahayana School to be a manifestation of the Ultimate Reality called dharmakaya, which is something possessing attributes of personality, viz., intelligence (prajna) and love (karuna).

The Samkhya system also is atheistic in its outlook. Though Max Muller thinks that the 'denial of an Isvara or personal Lord did not probably form part of the original Samkhya, as presented to us in the 'Tattvasamasa', according to traditional as well as modern consensus of opinion, earlier Samkhya is positively atheistic.[31] According to Samkhya, there is no logical proof of the existence of God. The inherent teleology in Prakriti is sufficient to explain creation, and the intervention of God is superfluous and unnecessary. But Samkhya admits the Godhoods of certain souls. These are individual souls who are merged in Prakriti, each emerging as a god in the beginning of a new cycle of creation, and lording it over all during that cycle. Such a god can be established by logic. The Samkhya accepts that wherever the word 'Lord' (Isvara) is used in the scriptures, it is in reference to the liberated souls or these beings. Thus Samkhya system does not believe in God. That is why it has been called 'Nirisvara (atheistic) Samkhya' in contrast with the system of Patanjali, which is called 'Sesvar Samkhya'.

Patanjali opens the topic of God with the Sutra 'Isvara Pranidhanad Va (and also by devotion of God).[32] He means thereby that samadhi can be attained, among other means, by devotion to God also. God in Patanjali philosophy is a particular Purusa who is ever untainted by troubles, actions, and their effects and deserts. These are some purusas who have become liberated and are free from all taints. There are others who are merged in Prakriti and who are free from such blemishes at present, but may again be effected by them. God is, however, one who never was and never will be tarnished by any blemish whatever. Moreover, God's attributes are the highest. He is whom pre-eminence reaches the zenith is God. He is not of a different category but is a singular type of purusa. He is the first teacher, because unlike other teachers, He is not limited by time. Though He has no desire, yet out of His grace towards all being He saves people immersed in samsara by imparting knowledge and virtue (dharma) to them. He is made up of the purest sattva; he is ever free and pre-eminent. He is omniscient.[33]

The Purva Mimamsa, according to the traditional view, is atheistic in its outlook. The universe, having neither beginning nor end, does not require any creator. God also cannot act as a supervisor of dharma and adharma, as the Naiyayikas hold, since dharma and adharma belong to the performer, and God cannot have any knowledge of them. God can have neither conjunction with nor inherence of dharma and adharma in Him, because conjunction is possible with substances and not qualities which dharma and adharma are, and because they inhere in individual souls and cannot inhere in an extraneous God.[34] Perception, inference and scriptures do not prove God. But scholars like Max Muller and P. Shastri infer that the Purva Mimamsa rejects God only as creator of differences in the lots of men, but not God as such. But this view does not seem to be tenable, because the early Mimamsakas are silent about the question of God and the later ones reject the proofs of God. This system cannot even be called polytheistic, because even the deities invoked by it are not said to have existence anywhere except in hymns that describe them. But the Mimamsakas of the later period introduced God into the system. Venkatesa, the author of Sesvara-Mimamsa, grafted Vedanta doctrine on Mimamsa. Apadeva and Laugaksi Bhaskara hold that if sacrifices performed are dedicated to God, they will lead to the highest good (nihsreyasa). This inclusion of apavarga ideal in the system is a later innovation.

According to Sankara, the Vedas are the only valid means of the knowledge of God. Reason in itself is futile as 'on account of the diversity of men's opinions, it is impossible to accept mere reasoning as having a sure foundation'. He, however, concludes, 'Our final position therefore is that on the ground of scripture and of reasoning subordinate to scripture, the intelligent Brahman is to be considered the cause and substance of the world'.

Ramanuja, more or less, agrees with Sankara's view that the scriptures are the only means of the knowledge of God. He says, "Because Brahman, being raised above all contact with the senses, is not an object of perception and other means of proof, but to be known through scripture only." But reasoning plays a secondary part 'with regard to supersensuous matters.' Scripture alone is authoritative, and reasoning is to be applied only to the support of scripture.

According to Madhava also God transcends all perception. But his nature is not indefinable, because we can know His nature through a study of Vedas.

God in Vaisesika-system

In the Vaisesika-Sutra of Kanada, God is not referred to openly. His famous aphorism which is repeated twice by him has no reference to God. The Sutra 'Tad Vacanadamanasyaya Pramanyam' (Being His words, the validity of the Vedas) has been held by some scholars to mean that the Vedas are the works of the seers,[35] and that the Sutra has no reference to God. Faddegon is also of the same view. He says "The Vaisesika-Sutras expose at length the essential concepts of the soul theory as we find it later in developed Nyaya-vaisesika (esp. V.S., 3.2.4.). But nowhere is a highest soul mentioned, nowhere is Isvara named and no passage directly refers to Him,"[36] Efforts have been made to interpret some of the Vaisesika-sutras to show that the Vaisesikas also, like other orthodox schools, were originally theistic in nature. But the interpretations are very doubtful. One can easily interpret these two sutras and see that Kanada did not mean to include Isvara in his sutras. And it is, perhaps, one of the reasons why the Vaisesikas have been called half-atheists (ardha vainasika) by the latter orthodox writers. But all the great writers on the Vaisesika-sutra are openly theistic and some of them, e.g., Udayana gives classical arguments to prove the existence of God. We cannot, therefore, treat the founder of the Vaisesika system as an atheist. Moreoever, Kanada believes in spiritualism and makes the physical universe subservient to the moral order. Prasastapada opens his commentary by paying homage to Isvara, the cause of the world. He then goes on to say that the knowledge of the six categories is the cause of liberation; this knowledge itself, however, results from dharma which is presribed by Isvara. In the last sloka of the book he mentions Mahesvara, whom Kanada is said to have pleased. Prasastapada describes how the world is created and destroyed by the desires of Isvara. In the description of creation, he says that the great Egg (mahadandam) is said to be brought into existence by the mere thought of the Supreme Lord. Further, when treating of the quality dimension (parimana), Prasastapada explains that largeness (mahatva) and length (dirghatva) are produced in the molecules by plurality (bahutva samkhya), just as minuteness (anutva) and shortness (hrsvatava) and length (dirghatva) are produced in the molecules by plurality (bahutva samkhya), just as minuteness (anutva) and shortness (hrsvata) in the binary atoms is produced by duality (dvitva samkhya). But this duality and this plurality depend for their existence on the knowledge of Isvara. Thus the author of Bhasya accepts the existence of God without attempting to prove it. Theism is not treated as an integral part of his philosophical system. Prof. Keith suggests that early discussions between Kanada and Prasastapada resulted in the assumption of a creator to explain the periodic cosmic process.

The next Vaisesika authors made further progress towards philosophical theism. Vyomasiva and Sridhara (I will consider Udayana with the authors of Nyaya) devote several pages to the proof of the existence of God and to a description of His nature. They do this, not in connection with the soul-theory, but when commenting on Prasastapada's exposition of the process of creation. Sivaditya mentions Isvara only one; but he does so when dealing with the substance soul: 'The Supreme Soul is Isvara and only one.' From the above exposition it is clear how theism was only gradually incorporated into Vaisesika, which originally ignored Isvara altogether.

God in Nyaya System

In the 'Nyaya-Sutra' of Gautama, God has not been mentioned as one of the twelve prameyas. From this it has been concluded by some modern scholars that the Nyaya-Sutra originally was not theistic. Garbe says that "The fundamental text books of the two schools, the Vaisesika and Nyaya-Sutras, originally did not accept the existence of God; it was not till a subsequent period that the two systems changed to theism, although neither ever went so far as to assume a creator of matter." Muir is also of the same view—"I am unable to say if the ancient doctrine of the Nyaya was theistic." But to this, Vittikara Visvanatha and others say that Atman as postulated among the prameyas included both Jivatman and Paramatman. That is why no separate mention of Isvara has been made.

There are three aphorism in the Nyaya-Sutra which discuss God. While Vatsyayna, Uddyotakara and Visvanatha regard it as the Nyaya view, Vacaspati, Udayana and Vardhamana interpret it as a criticism of the Vedanta view, that God is the constituent cause of the universe. To the objection that man does not often reap fruits proportionate to his acts, and so everything seems to depend on God's will and not on human effort, the Nyaya says that human acts produce their results under the control and with the cooperation of God. Vatsyayana supports theism when he declares that the self sees all, feels all and knows all. This description loses all meaning, if it is applied to the imperfect individual self. Later Naiyayikas are frankly theistic and enter into a discussion of the nature of God in considering the theory of Atman. Annam Bhatta classifies soul into two kinds, supreme and human. While the supreme is God, one, omniscient; the human souls are infinite in number, different in each body. God is looked upon as a special soul by Uddyotakara when he proves the authority of the Vedas by the fact that they have been asserted by a special self (Purusa-visesa). The meaning of special self is clear since the Sanskrit word, chosen by Uddyotakara, is taken from the classical definition of God in the Yoga-Sutras.[37]

Nature of God

God has been defined by Gautama, the author of the Nyaya-Sutra, as the efficient cause of the universe. It is He who gives the fruits of different actions. By Udayana, the author of Kusumanjali, he is defined as one whose worship is declared as the means of heaven and liberation. He possesses eternal consciousness, bliss and other similar qualities, which are generally ascribed to him. He is omnipotent as regards creation, etc., though He is also influenced by actions done by the souls. Vatsyayana regards God as a particular soul (Atma-visesa) endowed with merit, knowledge, intuition and devoid of demerit, false knowledge and inadvertence (pramada). He possesses eight kinds of super natural powers due to His merit and intuition.

God is absolutely different from the souls. He possesses the distinct qualities such as eternity of intelligence, number, dimension, separateness, conjunction, desire and effort. He possesses the six perfections in their fullness-majesty, power, glory, beauty, knowledge and freedom. God is above bondage and liberation. As He does not possess nescience (avidya) and pain, He is not bound. As He possesses merits and eight-fold aisvaryas. He cannot be called liberated. Liberation is a relative term, and the God who is never bound cannot be called liberated.[38]

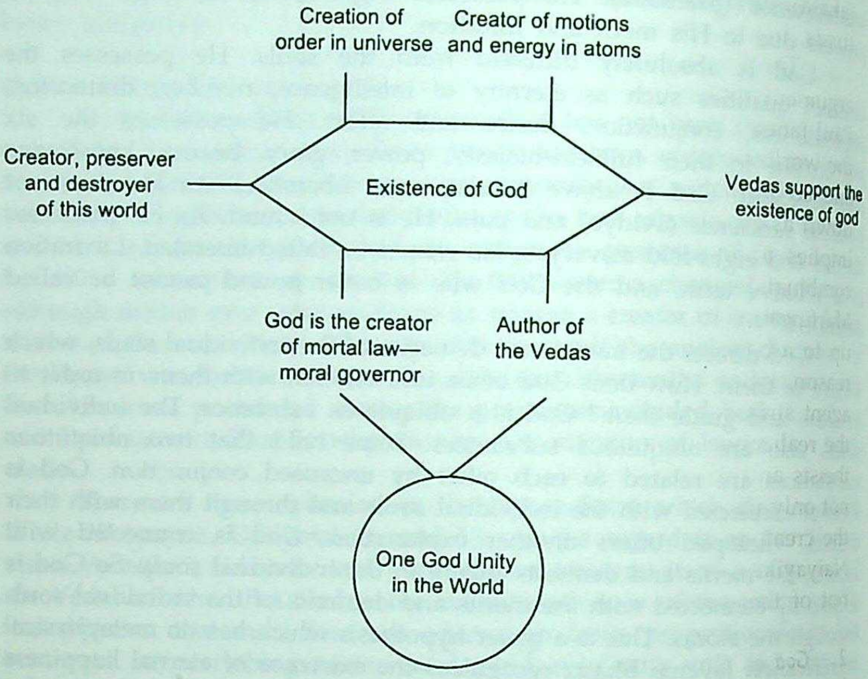
God directs the merits and demerits of the individual souls, which inhere in them. How does God come into relation with them, in order to activate and guide them? God is a ubiquitous substance. The individual souls also are ubiquitous substances. Some hold that two ubiquitous substances are related to each other by uncaused conjunction. God is forever connected with the individual souls and through them with their merits. Vacaspati offers another explanation. God is connected with atoms; the merits and demerits inhere in the individual souls. So God is indirectly connected with the merits and demerits of the individual souls through the atoms. This is a queer hypothesis which has no metaphysical significance. Jayanta Bhatta recognizes the existence of eternal happiness in God. But Vatsyyana, Uddyotakara, Udayana and Gangesa deny the existence of eternal happiness. They hold that God is absolutely free from pain. He is the substrate of eternal happiness, which does not constitute His essence.

Proofs for the Existence of God

The great Naiyayika, Udayanacarya, who has written as elaborate thesis on the proofs of the existence of God in his famous treatise 'Kusumanjali', has examined the foregoing arguments and found them wanting. At the beginning of his book, Kusumanjali, he says, "What doubt can there be in God, experience of whom is admitted throughout the world." So any argument in support of His existence of whom is admitted throughout the world." So any argument in support of His existence is unnecessary and redundant from the stand-point of Naiyayikas. But even then proofs of His existence have been adduced. Because, as Udayana writes, "This logical consideration of God is tantamount to thinking (manana) about him. It follows hearing (sravana) from Him and is undertaken as a form of worship (upasana).

History tells us that Jnanasri, a most formidable Buddhist dialectician, refuted theistic arguments in his 'Isvarbhangakarika'. Udayana who came after him had enough confidence in him to meet the arguments advanced by Jnanasri and declared in a most emphatic way that he rescued theism from the clutches of the Buddhist critics. The

CHART 7.1


Creation of order in universe
Creator of motions and energy in atoms
Creator, preserver and destroyer of this world
Existence of God
Vedas support the existence of god
God is the creator of mortal law—moral governor
Author of the Vedas
One God Unity in the World

work of Udayana led all later Nyaya-Vaisesika writers under a deep debt of gratitude who all derived inspiration from his outstanding work. Even the great Gangesa, who set forth a most masterly defence of theism in his 'Tattva-cintamani' followed in the foot-steps of Udayana.

In putting forward the various inferential proofs, Udayana writes in Kusumanjali, "From effects, conjunction, support, etc., from the use of things, from the authoritativeness of the Vedas, from sentences and from particular numbers, an immutable all-knowing God can be deduced."

1. The Causal Argument

The earth, etc., must have a maker since they are effects like the pot. Everything that is composite must possess an intelligent cause. Without such a cause, the material causes cannot produce definite effects. This intelligent agent is God. The order, design, co-ordination between different phenomena comes from God. Nyaya maintains that God is the efficient cause (nimittakarana) of the world. The atoms of earth, water, light and air are its material cause (upadanakarana). They are co-eternal with God. They are neither created nor destroyed by God. God does not evolve the world out of His nature. He does not create the world out of nothing by a mere fiat of will. He fashions the world out of the pre-existing atoms in time and space. He combines and arranges them in a particular order. He gives them unity, order and harmony. He does not create the atoms of earth, water, light and air. He does not create ether (akasa), time and space. He combines the atoms into dyads, dyads into triads, triads into quartrads, quartrads into more complex things.

This first argument of the Naiyayikas resembles the causal argument for God's existence as explained by some Western thinkers like Paul Janet,[39] Hermann Lotze,[40] and James Martineau.[41] According to them, the world of finite objects requires an intelligent cause which gives order and co-ordination to their concurrent physical causes. Thus Janet lays it down as a principle that all co-ordination between divergent phenomena implies a final cause or an intelligent agent who effects the complex combination of such separate phenomena. So also, both Lotze and Martineau start from the fact of physical causation in the world and rise up to a conception of an intelligent principle as its ultimate ground and reason. Indeed, the Naiyayika view of an efficient cause as an intelligent agent strikingly anticipates Martineau's idea of cause as well directed to the realization of ends. There is, however, some difference between these theists and the Naiyayikas. Western theists generally believe that God is not only the cause of the order and unity of things in the world, but also the creative energy that gives existence to the things of nature. For the Naiyayikas, however, God is only the cause of the order of nature, and not of the existence of the ultimate constituents of it.

2. *God as the Creator of Motion in Atoms and the Cause of their Combination*

The combination (ayojana) of the atoms is brought about by the agency of God. Atoms are inactive by nature. They are devoid of motion. The earlier Naiyayikas ascribed the motion of the atoms to the Unseen Principle (adrsta). A dyad is produced by the conjunction of two atoms. The two atoms are its material or inherent cause (samavayi karana). Their conjunction (samyoga) is its non-material or non-inherent cause (asamavayi karana). But the latter Naiyayikas ascribed the motion of the atoms to the Will of God. The atoms can move only when they are supervised by an intelligent agent. Notion of an unconscious thing is known to be due to the activity of an intelligent agent which directs it.[42]

Individual souls have finite knowledge. They cannot perceive the atoms. They are incapable of producing motion in them. They cannot combine them into dyads, triads, and gross material objects. God is omniscient and omnipotent. He perceives the atoms. He creates motion in them by His will, even as the individual soul creates action in the body by its will. God creates motion voluntarily and brings about conjunction between two atoms through it, and produces a dyad. He voluntarily creates motion, and brings three dyads into conjunction with one another, and produces a triad. God is the cause of motion of the unconscious atoms, which are the objects of His will.[43]

3. *God as the Supporter and Destroyer of World*

The whole world with all its things directly or indirectly requires the will of God to support it in its place and prevent it from falling. The support (dhrti) of the world is God who sustains it by His Will (vidharaka prayatna). Physical objects are unconscious. They cannot support themselves without being directed by an intelligent agent.[44] the unseen agency (adrsta) cannot support the world the world. It is unintelligent. It cannot act without the will of God.[45] The world is sustained by God endowed with knowledge, desire and volition. He has knowledge of the world. He has desire to support it. The world is also destroyed by God. Every product is destroyed like a jar. The world down to the dyads is destroyed by action due to the will of God.[46]

Thus God is the creator, preserver, and destroyer of the world. It is produced by God's creative will. It is supported by God's supporting will. It is destroyed by God's destructive will.[47]

4. *God's existence proved from the use of things*

'From the use of things' denotes that there must be a teacher for imparting the knowledge for the use of things. We find that instructions are needed for teaching the modern arts. So, for the traditional arts, which are current from endless time, there must be an instructor. And that instructor must be God.

5. *From the Authoritativeness of the Vedas*

The Vedas are valid and authoritative texts. This is due to the supreme authority of their author who must be omniscient, and so none other than God. The individual self cannot be the author of the Vedas, since the supramundane realities and the transcendent principles related in the Vedas cannot be objects of knowledge of any ordinary individual. Hence the author of the Vedas must be the supreme person who has a direct knowledge of all objects, past, future and present, finite, infinite and infinitesimal, sensible and supersensible. That is, the Vedas, like other scriptures, are revealed by God.[48]

The Mimamsa urges that the Vedas are authoritative because they are eternal. The Nyaya contends that words are valid because they denote proper objects; they owe their validity to their denotative capacity and not to their eternality. Words are sounds. Sounds are perceived as being produced and destroyed. They are not eternal. Words are utterances of persons. Just as 'Abhijnana Sakuntalam' was composed by Kalidasa, so the Vedas were composed by God. The Vedas consist of sentences. Sentences consist of words. Just as threads cannot arrange themselves into a cloth, so the words of the Vedas cannot arrange themselves into sentences. Just as threads are arranged into cloth by a weaver, so the words are arranged into sentences by God.[49] It cannot be argued that the composition of the Vedas differs from the composition of 'Abhijnana Sakuntalam' and, therefore, it is eternal. Just as the arrangement of a mountain differs from the arrangement of a jar, so the arrangement of the Vedas differs from the arrangement of a human composition. A jar is produced by a human being, while a mountain is produced by God. An epic is composed by a human being, while the Vedas are composed by God.[50]

6. *The Testimony of the Vedas*

God exists because the Vedic scripture bears testimony to His existence. "He is the Lord of all, omniscient, the inner controller, the cause of the world, its creator and destroyer."[51] "He is the Supreme person. He is omniscient."[52] "He is the Lord of all, the controller of all, the Ruler of all, the Lord of all creatures."[53] "He gives the fruits of merits and demerits to individuals."[54] Thus the Vedas speak of God as the creator, preserver and destroyer of the world, the inner controller of the souls, the giver of fruits of actions, the moral governor of the universe. The Vedas are authoritative; they bear clear testimony to the existence of God. Therefore, God exists.

But it may be argued here that why should one believe in God simply on the authority of the scriptures? An ordinary man may be inclined to do so, if he has not the spirit of critical enquiry in him. But a critical philosopher may say that scriptural testimony has no importance for philosophy, which is satisfied with nothing short of logically valid arguments in the attainment of true knowledge about anything, human or divine.

But as Kant[55] and Hermann Lotze[56] have clearly shown, none of the so-called proofs can really prove the existence of God. In truth, mere reasoning or logical argument cannot prove the existence of anything. The existence of a thing is to be known, if at all, through experience, direct or indirect. Experience is the only source of our knowledge about fact or existence. Lotze told us the truth about our knowledge of God when he said: "Therefore, all proofs that God exists are put forward in justification of our faith and of particular way in which we feel that we must apprehend this highest principle." This point becomes clearer when in his criticism of Anselm's form of the ontological proof, he observes: "To him (Anselm) the assumption that God does not exist seemed to conflict with that immediate conviction of its reality, which all our theoretic, aesthetic and moral activities constrain our souls to entertain."[57]

Some like Rousseau, have not even trusted logic and reason but have believed that our significant problems are solved by intuition, as though profound knowledge were hidden away in our sub-conscious minds, to be discovered only by probing deeply into our sentiments and by placing our faiths in instinct and feeling rather than in reason.

Kant, in his critique of Pure Reason, states the case of "a priori" knowledge. His argument is that, although reasoning is initiated by experience, the mind is aware of, and makes use of many instinctive truths which are independent of experience. This belief that there is a sort of intellectual conscience that guides us instinctively in our thinking and which is quite apart from the sensory reality is called Transcendentalism.[58]

It becomes clear from all this that God must be known through direct experience and not through any process of reasoning. Those who have no direct experience of God, must depend for their knowledge about God, on others who have that direct experience. The sruti being the expression of such direct experience of God is a just source of our belief in God.

7. *God as the Author of Moral Injunctions and Prohibitions*

The Vedic sentences deal with moral injunctions and prohibitions. The Vedic commands are the Divine Commands. God is the creator and promulgator of the moral laws or codes of dharma. He is the source of moral authority.[59]

8. *God as the Moral Governor Guiding the Law of Karma*

We reap the fruits of our own actions. Merit (punya) and demerit (papa) accrue from our actions and the stock of merit and demerit is called adrsta, the unseen power. But this unseen power being unintelligent, needs the guidance of a supremely intelligent God. God is the moral governor (karmaphala data). He makes merits produce pleasure. He makes demerits produce pain. God is the supervisor of the Law of Karma. He places the souls in their proper environments according to the Moral Law.

9. *The Argument from Number*

According to Nyaya-vaisesika the magnitude of a dyad is not produced by the infinitesimal magnitude of the two atoms each, but by the number of the two atoms. Number 'one' is directly perceived, but other numbers are conceptual creations. Numerical conception is related to the mind of the perceiver. At the time of creation, the souls are unconscious, and the atoms and the Unseen Power and space, time, minds are all unconscious. Hence the numerical conception depends upon the Divine Consciousness. So God must exist (samkhya visesat).

By those various arguments the Naiyayikas try to establish God. The Vaisesikas believe inference and scriptures to be the God. The Vaisesikas believes inference and scriptures to be the valid means of the knowledge of God. God is proved by the inference of an active principle as the creator of the world, independent of adrsta. As the author of the Vedas also He can be inferred.[60]

Aim of Isvara in Creating the Universe

Action is motivated by some ulterior purpose of satisfying a need either in the way acquisition of an advantage or avoidance of an evil. In the case of God no such motive can be supposed to set free an activity as He is completely free from all disadvantages and is self-sufficient and self-satisfied. A God with an unsatisfied want would be contradiction. Some hold that God engages in creative activity in a supportive mood.

Creation is but a game and pastime with Him, and no question of motive therefore can be urged as necessary. But Uddyotakara refuses to be convinced by this argument, as even play is not a motiveless activity. It is resorted to only with a view to enjoyment of the pleasure which is derived from it, and also because abstention from play causes uneasiness to those who are lovers of it. But such a contingency cannot be conceived to be possible with reference to God, because He is absolutely free from all shades of uneasiness and worry. The theory of playful activity therefore cannot be regarded as a satisfactory explanation of God's creative impulse.

Others, again, think that God wants to make others know His own infinite powers and glory (vibhutikyapana) and, therefore, creates the universe. European philosopher Herman Lotze subscribes to this view when he says that God's motive in creating the world was to communicate his holiness to us.[61] But this view is rejected on the ground that as God is fully satisfied in every respect, why should He like to make a show of His infinite powers and glory which does not add to Him anything; nor does He lose anything without making a show of His powers.[62]

After criticizing these two views, Uddyotakara gives his own. According to him God's creative activity follows from His very nature. It may be then asked that if creative activity follows from His nature, it would never cease and there would be no dissolution. To this Uddyotakara replies that creative activity follows from the nature of God who is endowed with intelligence. God creates the world with the aid of merits and demerits of the individual souls, which mature in particular times. He produces diverse effects out of the atoms in the presence of diverse merits and demerits. So the nature of God aided by diverse merits and demerits of the individual souls accounts for the creation of the multiform world for their enjoyments and sufferings.

God is One

It may be said that many gods produce the world out of the atoms. But the world has a unity. If it is created by many gods, it cannot have a unity. If there are many gods, they have conflicting purposes. They have conflicting volitions. So they cannot be co-ordinate lords of the world. They all cannot be moved by compassion for creatures. They cannot guide the merits and demerits of the individual souls uniformly, and create the world in accordance with them. This universe, full of order, unity and harmony cannot be created by plurality of gods with conflicting wills and purposes. If they are held to work in harmony with one another, one of them is enough for creation. Parsimony of hypotheses demands one God instead of many gods. If they are guided by a president. He ought to be regarded as the Creator and Ruler of the world, and not the republic of gods. Merits and demerits of the finite souls are supervised by one God according to the Moral Law.[63] If there are many gods, they are either omniscient or not. If they are not omniscient, they will be as impotent and helpless as we mortals are, and so they will not be equal to the task of creation and control of the world, which requires just these attributes. The result will be a failure to explain the world-order. If they are omniscient, one God is adequate to the task of creation, and others are redundant. If all are equally supreme, they cannot always have unanimity and, therefore, create one world. There is unity of purpose in the world. So we must infer that there is only one God as the creator of one world.[64]

Relation of God to the Individual Souls

Nyaya-vaisesika School does not believe in monism, and its philosophy can be characterized as uncompromising pluralism. The relation of individual souls to God is neither one of pure identity nor one of identity in difference, but one of the absolute and unqualified otherness. The relation of God to the individual selves is not internal but strictly and purely external. The individual souls are neither parts nor qualities nor modes of God. They are co-eternal substances belonging to the same genus. Bot the individual souls and Supreme Soul are endowed with spiritual qualities. Knowledge, pleasure, pain, desire, aversion, volition, merit and demerit are the qualities of the individual soul. Eternal knowledge, happiness, desire, volition and merit are the qualities of God. Both possess the generic qualities of number, magnitude, distinctness, conjunction and disjunction. Both are ubliquitous substances. Both are eternal. God is not the creator or destroyer of the individual souls.

But there is a remarkable difference between them. God is omniscient, omnipotent and all-perfect, while the individual souls have fragmentary knowledge, limited powers, and moral imperfections. God is free from pain, aversion, false knowledge, attachment, delusion, inadvertence, demerit and disposition, while the individual souls possess them all. God has eternal supernatural powers, while the individual souls are ordinarily devoid of them, but can acquire them to a limited extent. God has eternal moral perfection, while the individual souls acquire moral perfection by severe moral discipline and true knowledge. God is neither bound nor liberated, while the individual souls are bound first and then attain liberation. God is never in bondage, and consequently cannot attain liberation.[65]

God is like father to the individual souls. He treats them as father treats his children. He rewards them for their virtues and punishes them for their vices to work off the load of their merits and demerits and favours them with liberation by His infinite grace. He is like our own near and dear one constantly looking after our welfare.[66]

God as the Efficient Cause of the World according to Nyaya-vaisesika

The Naiyayika regards God as the efficient cause (nimittakarana) of the world. God is not its material cause, as He is for Vedanta. He does not create the world out of nothing by a mere fiat of will. He fashions the world out of the pre-existing atoms in time and space. He combines and arranges them in a particular order. He gives them unity, order and harmony. He does not create the atoms of earth, water, light and air. He does not create ether, time and space. He combines the atoms into dyads, dyads into triads, triads into quartrads, quartrads into more complex things. He is not the creator of souls. Atoms and souls are co-eternal with Him. They can neither be created nor destroyed by Him.

Some Vedantists maintain that Brahman is modified into the world, even as clay is modified into earthen vessels. Though Brahman is modified, He does not lose His eternal nature. This is the doctrine of modification of Brahman (Brahmaparinamavada). Others maintain that Brahman appears to be the phenomenal world-appearance through the limiting adjunct of beginningless cosmic nescience, which is the matrix of empirical names and forms. This is the doctrine of appearance of Brahman (Brahmavivartavada). Brahman limited by cosmic nescience (maya, avidya) is the ruler of the world. Rulership consists in the power of consciousness (cetnasakti) and the power of creation (kriyasakti), which exist in the Lord. He is the material cause of the world. Neither non-existence, nor prakrti, nor atoms are its material cause, because they are unconscious. The sruti says: "That resolved: I shall become many." So God is the material cause of the world.

Vacaspati criticizes the Vedanta doctrine. If Brahman is modified into the world, as clay is modified into earthen vessels. He is either entirely modified or partially modified. If He is entirely modified into the world He loses His essential nature. If He is partially modified into the world, He has parts and is non-eternal. If Brahman is eternal inspite of his being modified into the world, then it also is eternal because it is characterized by the characteristics of its cause. Hence the world is not the modification of Brahman. If Brahman appears as the false diverse world-appearance through the limiting adjuncts of empirical names and forms, which are modifications of beginning less cosmic nescience, then also the same difficulty will arise. One, partless, conscious, self-luminous Brahman cannot appear as the unconscious, material world of manifold objects. If one Brahman appears as many objects, He loses His identity. Then what is the status of the world of manifold objects. If one Brahman appears as many objects, He loses His identity. Then what is the status of the world appearance? It has the reality of Brahman, that is its ground. So it also is real and eternal. An illusion is due to the perception of the common characters of two objects and the non-perception of their individual peculiarities. A nacre is misapprehended as silver owing to the perception of their individual peculiarities. One who knows the real character of a nacre, never misapprehends it as silver. But Brahman is one, partless, conscious and self-luminous, while the world is manifold, possessed of parts, unconscious and non-luminous. Hence, there can be no perception of their common character and non-perception of their individual characters. Therefore, one, homogenous, self-luminous Brahman cannot appear as the manifold, heterogeneous, non-intelligent world-appearance. Further, Jayanta urges that Brahman being pure and taintless cannot be the material cause of the impurities of the world-appearance. The world is real and non-eternal. It is material, and cannot be a modification of consciousness. That the world is a false appearance of Brahman, is an irrational doctrine.[67]

The Samkhya regards prakrti as the material cause of the world, which is modified into the physical world, organisms, sense organs, manas, intellect (Buddhi) and egoism (ahamkara) for the enjoyments and sufferings of the finite souls (purusa). Prakrti is unconscious, active, modifiable, and eternal. The souls are conscious, inactive, unmodifiable and eternal. Prakrti is equipoise of sattva, rajas and tamas, which are in the nature of pleasure, pain and delusion. Prakrti evolves into mahat, buddhi or cosmic intellect, which evolves into ahamkara or cosmic egoism. Ahamkara evolves into the manas or mind, the five elements of earth, water, light, air and ether. The five tanmatras of colour, sound, taste, odour and touch produce the five elements or substances. The finite souls are in the nature of transcendental consciousness; they are inactive and indifferent. They are reflected in transparent buddhis in which sattva predominates, which are modified into the form of objects; the mental modes are reflected in the conscious souls, and appear to the cognitions of the souls, though they are unconscious modes of buddhi. The inactive souls appear to be active owing to their reflection in buddhis. Erroneous identification of the souls with buddhis is the cause of their apparent bondage. Discrimination of the souls from buddhis is the cause of their apparent release. In reality, the souls are eternally pure, conscious and liberated. When they have discriminative knowledge of their essential nature as pure, transcendentral consciousness, prakrti ceases to evolve for them. But all souls are not liberated at the same time. So the evolution of prakrti continues. Pleasure, pain, desire, aversion, volition, merit and demerit are modifications of unconscious buddhi. Cognitions of objects due to the sense-object-intercourse also are modes of buddhi. The pure self transcends them all.

The Nyaya refutes the Samkhya doctrine. Pleasure, pain and delusion are feelings of a conscious self, which are produced by physical objects. That the physical elements are composed of these feelings is incomprehensible. Buddhi is the knowledge of objects. Egoism is self-conscious. They cannot produce the external sense-organs. Substance have qualities but the subtle essences of odour, colour, sound, taste and touch cannot produce the physical substance of earth, water, light, air and ether. Cognition, pleasure, pain, desire, aversion, volition, merit and demerit can exist in a conscious self but not in an unconscious buddhi. The self knows an object which is determined by buddhi owing to its reflection in buddhi which is reflected back in the self. But the self is immutable and immovable, and cannot be reflected in buddhi. If buddhi is reflected in the self, then it becomes known like buddhi. But the self by nature is a knower and can never be known.

Further, if the self is by nature a knower, its reflection in buddhi is needless. If the self and buddhi are reflected in each other, and erroneously identified with each other, how can the former be known to be conscious and inactive and the latter be known to be unconscious and active? The self cannot have cognition without an eternal internal organ, which is its instrument. The assumption of eternal unconscious buddhi is needless, and the attribution of cognition, volition and the like to it is unwarranted. It is absurd to maintain that unconscious prakrti binds the soul to the chain of birth and death. Who guides prakrti not to bind the soul which has discrimination of itself from prakrti? The self by its very nature is a knower; it is said to know its intrinsic nature in release. But why does not prakrti bind a released soul? The soul is said to be in the nature of pure consciousness. But pure consciousness unproduced by an object is never experienced. So it cannot exist in the self in release, because there is no intercourse of the sense-organs with objects at the time cognition, desire, volition and the like are the qualities of the conscious and active self, and not of unconscious prakrti or buddhi.

If they are the qualities of buddhi, then its origin is due to merits and demerits, which are the auxiliary causes of all effects. These unseen agencies (adrsta) are modifications which can exist in prakrti, and cannot be destroyed because prakrti is eternal. If they exist in buddhi, which is supposed to be eternal, then reflection of the self and buddhi in each other will continue for ever, and the unseen agencies of buddhi will always be attributed to the self, which cannot be released. Unconscious prakrti cannot evolve and dissolve for the soul bondage and release. Inactive souls cannot direct the evolution and dissolution of prakrti. Further, bondage and release of the souls are not real, but apparent. So evolution and dissolution of prakrti are apparent only. Hence the Samkhya doctrine is not tenable.[68]

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36. As for example Sanker Misra in his 'Upaskara' sees a relevance to God in the third Suta.
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CHAPTER 8

CONCEPTION OF MOKSA (LIBERATION)

> The conception of Moksa lies in the realization of the Soul which is regarded as the highest value in 'Indian Thought'. The conquest of soul consists in knowing the reality behind the phenomenal world. Lord Buddha says, "If a man were to conquer in a battle a thousand times a thousands men and another conquer one 'himself' the latter is the greatest conqueror."
>
> —Dharampada, 103

8

CHAPTER

Conception of Moksa (Liberation)

People pursuing Moksa are the real gems to maintain the peace of Cosmos: and Equilibrium in Eco-System. Moksa is the means and purpose of life.

—*Aruna Goel*

We have discussed in earlier chapters about physical environment in which we are living. But this is only a tip of the ice berg. We must go beyond the environment, i.e. be one with God and lead a life of bliss or salvation and become liberated soul. For this, we have to move away from this physical world and make efforts for that: Indian philosophical system provides for that and gives us the means and methods by which we can make the environment beyond physical world full of sat, chit, and or truth, beauty and goodness.

The Truth of the Divine which is the spiritual reality behind all religions and the descent of the supramental which is not known to any religion are the sole things which will be the foundation of the work of the future.

—*Sri Aurobindo*

Happiness does not merely depend on riches and comforts of life, it is basically matter of attitude in the realm of one's inner mind. One can get more happiness by limiting desires as are basic to life, rather than expanding diseases and causing harm to physical and spiritual environment as well as making life of other people miserable. The need of the hour is to lead life on ethical and moral principles to seek salvation. Individuals are life drops in the ocean. They should uphold the purity of environment as it depends upon the efforts of each and every individual like drops in the ocean.

" . . . spiritually is not a high intellectuality, not idealism, not an ethical turn of mind or moral purity and austerity, not religiosity or an ardent and exalted emotional fervour, not even a compound of all these excellent things; a mental belief, creed or faith, an emotional aspiration, a regulation of conduct according to a religious or ethical formula are not spiritual achievement and experience.

These things are of considerable value of mind and life; they are of value to the spiritual evolution itself as preparatory movements disciplining, purifying or giving a suitable form to the nature; but they still belong to the mental evolution,—the beginning of a spiritual realisation, experience, change is not yet there.

Spirituality is in its essence an awakening to the inner reality of our being, to a spirit, self, soul which is other than our mind, life and body, an inner aspiration to know, to feel, to be that, to enter into contact with the greater Reality beyond and pervading the universe which inhabits also our own being, to be in communion with It and union with It, and a turning, a conversion, a transformation of our whole being as a result of the aspiration, the contact, the union, a growth or waking into a new becoming or new being, a new self, a new nature."

—*Sri Aurobindo*

The concept of moksa lies in the realization of the soul which is regarded as the highest value in Indian thought. The conquest of soul consists in knowing the Reality behind the phenomenal world. Lord Buddha says, "If a man were to conquer in a battle a thousand times a thousand men and another conquer one 'himself' the latter is the greatest conqueror."[1]

Desire and action for the achievement of Moksa helps the individuals to lead a pure life resulting into a bliss of internal and external environment. There will be no greed, no exploitation, no wrong desires, thus paving the way for not only pollution-free environment but a positive and stimulating environment radiating peace, harmony and balance. Bhagwan Das in his introduction to the Vol. IV of the cultural heritage of India, (Ramakrishna Mission, Calcutta, 2001) states: (see Chart 8.1)

The goal of life, according to the Sanatana Dharma (Hinduism) is two-fold—abhyudaya and nihsreyasa—consisting of the four values (purusartha) or dharma, artha, kama, and moksa. Abhyudaya consists of dharma, artha, and kama, or to put them in the reverse order, sense-joy, refined by wealth and regulated by law. This group of triple values is, broadly speaking, to be pursued in the first half of life, the first two asramas—those of a brahmacharin (student) and a grahstha (householder). The second half of life, made up of the next two asramas —those of a vanaprastha (hermit) and a sannyasin (monk), is to be devoted to the achievement of nihsreyasa (summum bonum), which consists in attaining moksa (salvation), deliverance from all sorrow, doubt, and fears. (see Chart 8.2)

FIG. 8.1

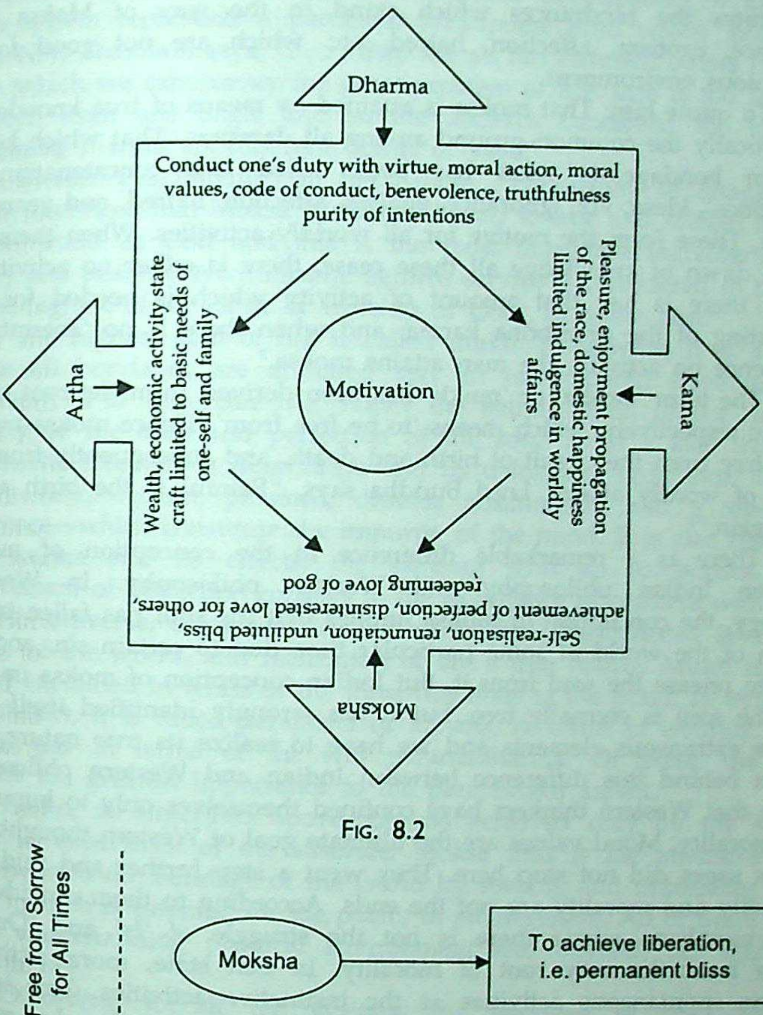
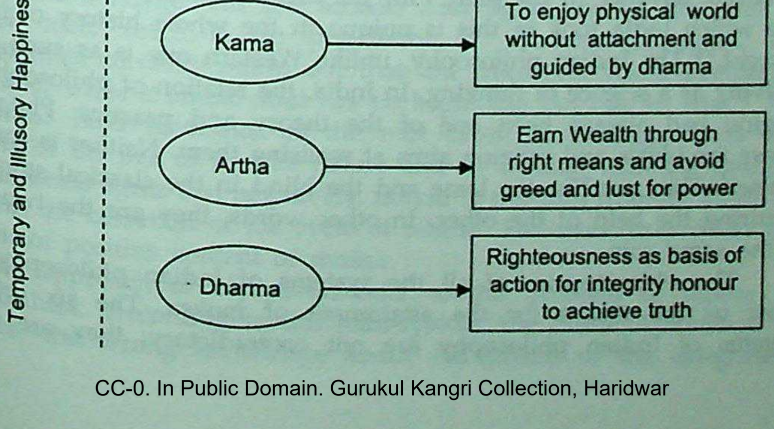

Dharma
Conduct one's duty with virtue, moral action, moral values, code of conduct, benevolence, truthfulness purity of intentions
Artha
Wealth, economic activity state craft limited to basic needs of one-self and family
Motivation
Pleasure, enjoyment propagation of the race, domestic happiness limited indulgence in worldly affairs
Kama
Self-realisation, renunciation, undiluted bliss, achievement of perfection, disinterested love for others, redeeming love of god
Moksha

FIG. 8.2


Free from Sorrow for All Times
Temporary and Illusory Happiness
Moksha
To achieve liberation, i.e. permanent bliss
Kama
To enjoy physical world without attachment and guided by dharma
Artha
Earn Wealth through right means and avoid greed and lust for power
Dharma
Righteousness as basis of action for integrity honour to achieve truth

Ganganath Jha in his article, "Religion of the Nyaya and Vaisesika, enumerates the hindrances which stand in the way of Moksa like ignorance, egotism, affection, hatred, etc. which are not good for a harmonious environment.

To quote him: That moksa is attained by means of true knowledge is practically the common ground among all darsanas. That which keeps man in bondage is what has been called 'the concatenation of aberrations', klesa, viz. ignorance, egoism, affection, hatred, and yearning for life. These form the motive for all worldly activities. When therefore on the dawn of knowledge all these cease, there is either no activity at all, or there is just that amount of activity which is needed for the exhausting of the prarabdha karma; and when there is no 'aberration', and hence no activity, the man attains moksa.[2]

The term 'moksa' or 'mukti' has been derived from the root moks or muc respectively, which means 'to be free from'. Hence moksa means to be free from the circuit of birth and death, and consequently from all kinds of wordly affairs. Lord Buddha says, "Painful is the birth again and again."[3]

There is a remarkable difference in the conception of moksa between Indian philosophy and Western philosophy. In Western theology, the conception of moksa implies that the soul has fallen in the dearth of the world at some particular time due to certain sin, and we have to release the soul from it. But Indian conception of moksa implies that the soul is eternally free, but it has wrongly identified itself with certain extraneous elements and we have to realize its true nature. The reason behind this difference between Indian and Western philosophy seems that Western thinkers have confined themselves only to humanity and morality. Moral values are the ultimate goal of Western thought. But Indian sages did not stop here. They went a step further and said that humanity and morality are not the ends. According to them our ideal is super-moralism, where there is not the struggle of 'Is' and 'Ought', which is at the very root of morality. In that state, moral activities become spontaneous activities as the instinctive activities. This is the stage of moksa. Prof. Hiriyana writes, "The conception of moksa makes a definite advance in the search for the ideal in Indian thought and the step which India took in this is unique in the whole history of human thought."[4] The Indian philosophy, unlike Western one is as such an art of living as a science of thinking. In India, the relation of philosophy and religion had always been one of the theory and practice. Philosophy shows the ideals and religion aims at realising them. Neither is complete in itself. They are like the lame and the blind in the classical story each requiring the help of the other. In other words, they are the two facets of the same coin.

The ultimate aim of all the systems of Indian philosophy is to show us the means for the attainment of moksa. The six orthodox systems of Indian philosophy are not contradictory; they are closely connected together and present an integrated development of thought. Each system represents a particular standpoint from which Reality is seen. N.V. Thandani says, ". . . . they are all but different points of view from which we can survey the great problem of life. Life is too large to be seen from one angle and so the ancients conceived the idea of examining it from six different points of view.[5]

Swami Tyagisananda in his Article, "Philosophy of Bhagavata", rightly mentions that Moksa is directly linked to true and selfless service to the world as God and this is the most important ingredient of a happy and peaceful environment. Selfless service is considered to be one of the highest of all kinds of worship of God. To quote him:[6]

The highest goal of life is called mukti. Negatively, it is a state where all bondages are annulled and an unhampered freedom felt; positively, it is the achieving, rather the getting back, of the natural divinity or the bliss and perfection of the soul, as of a lost 'treasure trove'. The freedom is from Maya and its delusions—ignorance, doubt, misery, fear, egoism, passions, desires, attachments, and a sense of difference—which constitute the impurity of the mind. It is also freedom from karma and its effects, the samsara with all its hordes. The achievement of perfection consists in the experience of oneness with God and His universe, enjoyment of undiluted bliss, disinterested love and service of the world, and realization of one's true nature. Mukti is also further explained in terms of the three functions of the mind. In terms of the intellect, it is called parajnana or vijnana, in terms of emotion para bhakti, and in terms of the will paramadharma. Of these, the text attaches the greatest importance to the para bhakti aspect.

Mukti, as described above, can be achieved only by the super conscious experience of the absolute. Moksa thus is the attainment of freedom from the bondage of the world by seeking and redeeming love of God which is essential for the purity of environment. All of these help us in understanding physical environment and beyond, i.e. spiritual realm of life.

According to all the systems the bondage of the soul is beginningless. We cannot mention any particular time when the soul entered into bondage. All the schools also agree that if the soul is liberated once, there is no possibility of its bondage again. Dr Radhakrishnan correctly points out that 'the freed soul has a beginning but no end, while a bound soul has no beginning but has an end."[7] All the systems hold ignorance as the root cause of bondage. It is the ignorance of the jiva of its true nature and its relation with the Reality. All the systems agree that negatively, moksa is freedom from all kinds of pains and the cessation of the cycle of rebirth. However, they differ on the point of positive content of moksa.

The approach of Nyaya-vaisesika to the problem of moksa is purely realistic. According to this joint-system, the cause of bondage is ignorance—the wrong knowledge about the nature of the categories, which causes the apprehension of not-soul as soul. To remove this ignorance, Nyaya-vaisesika proposes to give us a knowledge of reality or realities for the realization of the highest good. Gautama and Kalidasa have said that the true knowledge of the categories will bring the highest good, that is the moksa. After true knowledge has been acquired, the wrong notions about the soul will disappear followed by the disappearance of the defects. The defects having been removed, there will be no activity (pravrtti) towards the worldly things. In fact, our worldly activities alone compel us to take fresh births; but now, when the cause itself is made ineffective, there would not be any more birth. Again, all our pains are due to our taking birth; but now, when the birth is stopped, why should there remain any pain? That is, a man becomes free from pain, in the long-run, after acquiring the true knowledge. In other words, he acquires moksa in the true sense of Nyaya and Vaisesika.

But a worldly man may ask if liberation could be achieved. According to him, liberation appears to be simply a word without meaning, an ideal which can never be realized. Nyaya-vaisesika philosophers have anticipated certain doubts which can be raised by a worldly man against the possibility of liberation. While removing these doubts, they have maintained that liberation is not simply 'a pious wish', but a fact which can be realized and achieved. The doubts anticipated by them are as follows:[8]

1. *Rnanubandha*

According to sruti, when a man takes birth he comes with three debts which he has to pay during his life. They are the debts (a) of the saints and sages (rsis), (b) of the ancestors (pitras) and (c) of the Gods (devas). It is necessary that a man should be free from all these debts. Then, how can he think to attain liberation?

2. *Klesiinubandha*

There are hundreds of defects in man. It appears to him quite impossible to get rid of them. Then, where is the time with him to think of attaining liberation?

3. *Pravrttyanubandha*

Activity is instinctive for man. He cannot remain inactive even for a moment. While doing actions, he is attached with the fruits of them, which causes the circuit of birth and death. Then, how can he attain liberation?

The purpose of Moksa is to Channelise the energy in a purposeful form to make the life of the individual blissful and peace in the cosmos as well as relieve people from bad elements confronting them.

Nyaya-vaisesika philosophers have attempted to remove these doubts. Naiyayikas hold that the term 'debt' in the above case is only secondary; what is important is to observe brahmacarya, grhasthasrama and the performance of religious rites. Had liberation been impossible, there would have been no sense in mentioning a stage after grhasthasrama by the sruti. The real significance of this stage of life lies in preparing one for liberation. As regards the defects, Naiyayikas maintain that they are not irremovable. One can get rid of them by constantly thinking contrary to them. Besides this, it is only because of these defects that a man is disgusted with the worldly life, and naturally turns towards renunciation, which is a necessary prerequisite for the attainment of liberation. Regarding the third doubt; viz., Pravrttyanubandha, Naiyayikas maintain that when these defects, the cause of bondage, have been removed, the activity cannot help the continuity of the cycle of rebirth.[9]

Thus, the Nyaya-vaisesika philosophers have maintained that liberation is not a pseudo concept, an ideal which can never be realized. They emphatically maintain that one who makes efforts for the attainment of liberation can reach the goal. The Naiyayikas' definition of liberation is "the absolute freedom from all pains."[10] The Vaisesika sutrakara explains it as "the non-existence of conjunction with the body, when there is at the same time no potential body existing, and consequently rebirth cannot take place."[11] The Tarkadipika defines it as "the absolute destruction of all pains." Uddyotakara defines it as "the absolute absence of all pains." It means the attainment of positive goals rather than entangle oneself in petty goals. All this lead to purification of environment.

From all these definitions, we see that moksa has been defined in the joint-system negatively as the cessation of pain, and not as the enjoyment of positive pleasure. For pleasure is always followed by pain. Our everyday experience shows that all pleasures are mixed with pains which follow them immediately. In fact, they are not pleasures, but pains in a disguised form. So, a wise man should abandon all worldly pleasures, even as a wise man avoids taking food which is mixed with poison and honey both.[12] In all the above definitions, destruction of pains implies the destruction of pleasures also. It shows that liberation is a state in which the soul is released from all bonds of its connection with the body and the senses. So long as the soul is conjoined with a body, it is impossible for it to attain the state of utter freedom from pain. The body with the sense-organs being there, we cannot possibly prevent their contact with undesirable and unpleasant objects and so must submit to the inevitable experience of painful feelings. Hence in moksa, the soul must be free from the shackles of the body and the senses. So, liberation consists in the soul's existence in its natural condition.[13] This state of pure existence to which the liberated souls attain is compared to the state of deep dreamless sleep.[14] It is just that supreme condition of the soul which has been variously described in the scriptures as 'freedom from fear', 'freedom from decay and change' 'freedom from death' and so forth.[15]

According to Nyaya-vaisesika, liberation of soul consists in abandoning all its adventitious properties, viz., cognition, pleasure, pain, desire, aversion, volition, merit, demerit, and impression.[16] It simply disjoins all its adventitious qualities and remains in its pure form. Nyaya-vaisesika holds that liberation takes some time even after the attainment of right knowledge. Vatsyayana mentions that after the attainment of right knowledge the attachment with the worldly objects is destroyed. Consequently, he has no inclination to do any action by mind, speech and body, which may bring him to another birth. All his prarabdhakarmas are gradually exhausted, and he has no need to take birth again.

By the stoppage of the cycle of rebirth, all his pains are destroyed, and consequently he is liberated. Nyaya-vaisesika does not believe in embodied release. According to it the only cause of bondage is embodiment; so the conception of jivanmukti is a contradiction in terms.

There are certain doubts. For instance, some feel that if there be really the cessation of pain in the moksa, then everybody would like to become liberated. And if that be the fact, then some day or the other, all will become liberated, and the worldly process will certainly stop. To this objection, it is said that the knowing ones being continuously emancipated, there does not become a void (of the Atman), inasmuch as the number of these atmans in the universe is infinite; if there were an end, or an increase or decrease in their number, then alone could such a void be possible, as in the case of things of limited dimensions. When the atman is without any limitation, then there is no possibility of such doubts.[17] Again, others feel that the Atman being eternal, there would be no emancipation for one who perceives or realizes this eternal Atman; as being always affected by a longing for pleasure, he would have an attachment to the means of pleasure and aversion to those of pain; and these two, namely, attachment and aversion, would give rise to constant activities and cessation from activities; and these, in their turn, would give rise to merits and demerits which will lead to births and rebirths and consequently, there is no possibility of moksa.

To this, it is said that it is not so; because, for one who recognizes the eternal Atman, there would come about due dispassion, produced from a recognition of the evils inseparable from the objects of enjoyment; and this dispassion would, in due course, bring about liberation.[18]

Means to Liberation

According to Nyaya-vaisesika, first of all the aspirant of liberation should acquire the knowledge of the categories propounded by Gautama and Kanada. The true knowledge of the self and all other objects of experience will bring liberation gradually. He must know the self as distinct from the body, the mind, the senses, etc. For this he should first listen to the scriptural instructions about the self (sravana). Then, he should firmly establish the knowledge of the self, by means of reasoning (manana). Finally, he must meditate on the self, in conformity with the principles of yoga (nididhyasana). These help him to realize the true nature of the self as distinct from the body and all other objects.[19] Yoga practices are conjouned.[20] When merit (dharma) born of yoga reach perfection, excellent disposition of ecstasy gives rise to true knowledge (tattvajnana).[21] Eight-fold yoga practice such as abstention (yama), Observance (niyama), posture of body (asana), breath-control (praayama), withdrawal of the sense-organs from their objects (pratyahara), fixed attention (dhyana), contemplation (dhara), and concentration (samadhi) are aids to the realization of true knowledge.[22]

Sridhara maintains that the knowledge of reality and performance of duties, both are necessary for moksa. Moksa is not due to knowledge alone, but due to the combination of knowledge with duties.[23] The prohibited actions and the prudential duties (kamya-karma) should be discarded. But the compulsory duties and the occasional duties must be performed, because they purify the mind, and non-performance of them will produce the sin of omission which will require another birth to be exhausted. Udayana also maintains that the performance of obligatory duties and knowledge of the self are the prerequisites of release. But he does not regard them co-ordinate or equal in importance, and consequently does not speak of the combination of knowledge and works as the means of release. The works are auxiliary to knowledge. They bring about purity of mind which is necessary for true insight into the nature of the self. Hence the knowledge of the reality itself is the direct means of release.

The Nyaya-vaisesika criticizes the theories of liberation accepted by other systems and shows that they admit the truth of the Nyaya view. The Carvaka holds that independence is liberation and dependence is bondage.[24] The Naiyayika urges that the Carvaka view contains an element of truth; independence involves cessation of pain. But independence, in the sense of lordship, cannot be the highest good, since there are different degrees of lordship, higher or lower, and there is rivalry among lords of equal power. Hence the Carvaka view of moksa is wrong.

The Madhyamika Bauddha holds that the extinction of the soul is liberation. The Naiyayika urges that this view contains an element of truth; the extinction of the soul involves the extinction of pain. But it is wrong to hold that the soul, like the body, is the cause of pain, and should therefore be extinguished. Is the soul a series of cognitions or something beyond them? If it is nothing but a series of cognitions, the Naiyayika also holds that liberation consists in the extinction of all qualities of the soul such as cognition, pleasure, pain and the like. If it is an entity beyond the series of cognitions, it is eternal and therefore cannot be destroyed. Moreover, everything is dear for the sake of the soul. No one can strive for the extinction of the soul which is the dearest of all.

The Yogacara Bauddha holds that emergence of pure cognition is exaltation or liberation. The Naiyayika urges that there can be no cognition in liberation, since its causal conditions do not exist at the time. Moreover, the soul being impermanent, meditation on the four noble truths cannot bring about any perfection in it and cause pure cognition. Further, the soul being impermanent, the same soul cannot be in bondage at first, and then attain liberation. So liberation cannot consist in pure cognition free from error and illusion.

The Jaina holds that liberation consists in the soul's transportation to a supra-mundane sphere on the removal of the veil from it. The Naiyayika urges that the Jaina view is right if the veil that covers the soul consists in merit and demerit. The Naiyayika admits that merits and demerits are destroyed in liberation. But the Jaina holds that the soul is transported to a supramundane region, when its crust of subtle karma-matter is destroyed. The Naiyayika urges that the soul is either corporeal or incorporeal. If it is corporeal, it is either with or without parts. If it consists of parts, it is non-eternal. If it is destroyed, it is not rewarded for its righteous actions, and punished for its unrighteous actions. If it is devoid of parts it would be like an atom which is corporeal and partless, and hence its qualities would be imperceptible like those of an atom. If the soul is incorporeal, it would be incapable of movement, since a corporeal substance only is capable of movement. Hence the Jaina view is also wrong.

The Samkhya holds that the existence of the self in its intrinsic condition due to its isolation from prakrti constitutes its liberation. Its erroneous identification of itself with buddhi, an evolute of prakrti, constitutes its bondage. When the self discriminates itself from prakrti and its evaluates, the activity of prakrti ceases for it, and it realizes its liberation. The Naiyayika urges that consciousness of difference between Prakriti and Purusa resides either in the Purusa or in prakrti. It cannot reside in the former, since it is unchangeable. Nor can it reside in the latter, since it is unconscious. Moreover, prakrti is either active or inactive by its nature. If it is ever active by nature its activity can never cease, and the soul cannot be liberated. If it is inactive by nature, the soul cannot be in bondage, since the evolution of prakrti accounts for the experience and bondage of the self. The Vedantists hold that liberation consists in eternal happiness and this is not achieved from somewhere outside, but is simply manifested, which was, till then, lying manifested. It is rejected by Naiyayika, because there is no proof in support of it. No one perceives eternal happiness. We always perceive pleasure mixed with pain. Eternal happiness cannot be inferred from any trace of a sign or mark. Though certain scriptural passages can be quoted in support of the Vedanta view, these passages, according to Nyaya-vaisesika, use the word pleasure in the negative sense of absolute cessation of pain. It does not mean any positive experience of pleasure. In our everyday life also, we use the word pleasure to denote the absence of pain. Further, if the state of liberation is a state of eternal happiness, then one will naturally have a constant desire to attain it; but there can be no liberation so long as one has not extinguished all his desires including the desires for liberation. For this reason also the Vedanta view cannot be accepted.[25]

Uddyotakara urges that if the released soul is to have everlasting pleasure, it must also have an everlasting body, since experiencing is not possible without the bodily mechanism. The Vedantist holds that eternal happiness of the self, which is self manifest, is veiled by individual nescience (avidya) in empirical life. The Naiyayika urges that individual nescience is significant and cannot veil the self-luminous eternal happiness of the self. Hence the self is not of the nature of eternal happiness.

Tutata Bhatta holds that eternal bliss becomes manifested in the atman during the state of liberation. But Vatsyayana shows that this view is not tenable for want of sufficient proofs, and hence he rejects it. He says what is the cause of the manifestation of eternal bliss? It also cannot be eternal, for, if it were so, then why should it not be felt during the state of bondage. If both were eternal, then it will also have to be assumed that together with the eternal manifestation of the eternal bliss, even during the state of bondage, there are the simultaneous experiences of pleasure and pain due to the merits and demerits which, of course, is against the reality.

In order to remove this difficulty, if it be held non-eternal, then, again, the cause of it must be found out. Besides the contact of the manas with the atman, there must be some auxiliary cause also. Merit cannot be this auxiliary cause, for in that case, it is necessary to find out the cause of this merit also. Nor can it be held that the merit produced by the yogic samadhi is the necessary cause, for every merit, after producing its requisite result, is destroyed; so that, the yogic dharma also will come to an end at some particular time, and together with it the effect of it, namely, the experience of eternal bliss, will also disappear. Nor can it be held that although the bliss is eternal, and as such, is equally present both in the state of liberation and that of bondage, yet it is not experienced during the latter state owing to the presence of an organism; for, the pleasure of organism, which is exclusively helpful to the experience of pleasure and pain, cannot be an obstacle in the way of the experience of eternal bliss. Therefore, Vatsyayana thinks that the view is unsound and rejects it.

All the systems of Indian Philosophy mention the following positive means or right means which can keep the integrity of the person pure as well as the environment enchanting with bliss and perfection.

Human excellence depends upon the will power of human beings which is basic to excellent personality development. Will is the motive power, driving force and takes human beings at a higher plane. Will power strengthens spirituality and character. Human excellence, to become mature needs time and thus patience is required for maturing. Impatience only wastes our vital energy and impairs our will power.

Let us now review the ingredients of human excellence as given in Sanskrit literature which can promote moksa.

Performance of ones duty without attachment i.e. without the thought of personal benefit or nepotism.

तस्मादसक्त: सततं कार्य कर्म समाचर: ।
असक्तो ह्याचरन् कर्म परमाप्नोति पूरुष: ।।

3/19 Bhagavad Gita

Therefore, go on efficiently doing your duty without attachment. Doing work without attachment man attains the Supreme i.e. excellence.

Renunciation of attachment implies renunciation of desire as well; for it is from attachment that desire springs up (II.62). It is, therefore, that renunciation of the desire for fruit has not been separately mentioned.

By constantly dwelling on objects of enjoyment man develops an intensive form of attachment for them. This awakens in his mind a keen desire to obtain various forms of enjoyment. This is what is meant by attachment giving rise to desire. And when some hindrance appears in the fulfilment of this desire, he develops hatred for the cause of this hindrance, and the hatred is transformed into anger. This is what is meant by desire producing anger.

मा वाऽकर्ता भव प्राज्ञ किमकतृतयेहिते ।
साध्यं साध्यमुपादेयं तस्मात्स्वस्थो भवानघ ।। 7 ।।

Neither think yourself as actor, because no actor can attempt to do anything. Discharge whatever is your duty, and remain at your ease with having done your part. (Yoga Vasistha—Utpatti-Prakarana, Book 3)

All the changing things and events of this world have to be covered with Isa (God—the Supreme Reality). Live your life in a spirit of non-attachment. Don't crave for possessions which are not yours.

The Chandogya Upanisad, for example, prescribes:

All this is Brahman. Mediate calmly on Him as the One from whom everything is born, by whom everything is maintained and annihilated.

Dedication towards one's work and doing it honestly.

मयि सर्वाणि कर्माणि संन्यस्याध्यात्मचेतसा ।
निराशीर्निर्ममो भूत्वा युध्यस्व विगतज्वर: ।।

3/30 Bhagavad Gita

Therefore, so long as while performing actions or enjoying their fruit a praticant is found to have the feeling of possession and desire with regard to those actions and their fruit, or so long as his mind is subject to morbid feelings such as attraction and repulsion, joy and grief, etc., it should be clearly understood that all his actions have not been dedicated to god.

Acquire complete knowledge about the work in which one is engaged. Men should act according to buddhi or understanding. If we are victims of our impulses, our life is as aimless and devoid of intelligence as that of the animals. If we do not interfere, attachments and aversions will determine our acts. So long as we act in certain ways because we like them and abstain from others because we dislike them, we will be bound by our actions. But if we overcome these impulses and act from a sense of duty, we are not victims of the play of prakrti. The exercise of human freedom is conditioned and not cancelled by the necessities of nature.

न हि ज्ञानेन सदृशं पवित्रमिह विद्यते ।
तत्स्यवं योगसंसिद्धः कालेनात्मनि विन्दति ।।

4/38 Bhagavad Gita

There is no purifier as great as Knowledge, he who has attained purity of heart through a prolonged practice of Karmayoga automatically sees the light to Truth in the self in course of time.

4. *Action-oriented*

Mere accumulation of knowledge would be of no use unless put to action. Words written or spoken are of no use unless put to action.

सन्यासः कर्मयोगश्च निःश्रेयसकरावुभौ ।
तयोस्तु कर्मसंन्यासात्कर्मयोगो विशिष्यते ।।

5/2 Bhagavad Gita

The Yoga of Knowledge and the Yoga of Action both lead to supreme Bliss. Of the two, however, the Yoga of Action (being easier of practice) is superior to the Yoga of Knowledge.

Shri Radhakrishanan says that there is more happiness in doing one's own work even without excellence than in doing another's duty well. Each one must try to understand his psycho physical make-up and function in accordance with it. It may not be given to all of us to lay the foundations of systems of metaphysics or clothe lofty thoughts in enduring words. We have not all the same gifts, but what is vital is not whether we are endowed with five talents or only one but how faithfully we have employed the trust committed to us. We must play our part, manfully, be it great or small. Goodness denotes perfection of quality. However distasteful one's duty may be, one must be faithful to it even unto death.

Swami Jagadatmananda in his book, "Learn to Live", Vol. I, rightly says:

Instability and indecision mark the state of mind which is not subject to any discipline. The energies of an undisciplined mind are scattered in many directions and are wasted. A person with an unsteady mind can not achieve any thing worthwhile. By doing all work, big or small, with concentration and methodically, one gathers the ability to work with efficiency and ease.

Control over Senses to Avoid any Temptation to do Wrong Actions

योगयुक्तो विशुद्धात्मा विजितात्मा जितेन्द्रियः ।
सर्वभूतात्मभूतात्मा कुर्वन्नपि न लिप्यते ॥

5/7 Bhagavad Gita

The Karmayogi, who has fully conquered his mind and mastered his senses, whose heart is pure, and who has identified himself with the Self of all beings, remains untainted, even though performing action.

So long as one's mind and senses are not controlled, they naturally run after sense enjoyments; and so long as impurities in the form of likes and dislikes exist in the mind it is difficult to remain equipoised in success and failure. Hence, until the mind and senses are fully controlled and perfect purity of heart is attained a practicant, cannot be called a real Karmayogi.

प्राज्ञे यथार्थभूतेयं वस्तुदृष्टिः प्रसीदति ।
दृगिवेन्दौ निरम्भोदे सकलामलमण्डले ॥

Yoga Vasistha Mumuksu Prakarana, Book 2, Sloka 71

The true light of things dawns only in the minds of the wise, as the gentle moon appears to sight only in the clear and cloudless sky.

पूर्वापरविचारार्थचारुचातुर्यशालिनी ।
सविकासा मतिर्यस्य स पुमानिह कथ्यते ॥

Yoga Vasistha Mumuksu Prakarana, Book 2, Sloka 72

He is truly called a man who can judge (the truth) by the major and minor proposition, whose mind is expanded and fraught with brilliant ingenuity.

> "Some say knowledge is power,
> others say, the above is not true.
> Character is power and wealth."

—Satya Sai Baba

No temptation to take credit for action/results—People should not be tempted to personify them for results to come into lime-light. This would add to the impurities in mind to make him proud.

युक्त: कर्मफलं त्यक्त्वा शान्तिमाप्नोति नैष्ठिकीम् ।
अयुक्त: कामकारेण फले सक्तो निबध्यते ।।

5/12 Bhagavad Gita

Offering the fruit of action to God, the Karmayogi attains everlasting peace in the shape of God-Realization; whereas he who works with a selfish motive, being attached to the fruit of actions through desire, gets tied down.

सन्तुष्टिपरतृप्तस्थ महत: पूर्णचेतस: ।
क्षीराब्धेरिव शुद्धस्य मुखे लक्ष्मीर्विराजते ।।

Yoga Vasistha Mumuksu Prakarana, Book 2, Saloka 13

There is a beauty shining in the face of one, whose mind has the satisfaction of contentment, the fullness of magnanimity and the purity of thoughts likes that of the milky ocean in it.

Avoidance of Lust and Anger

Everybody in the world seeks happiness. But very few know what is real happiness and how to attain it. Due to this ignorance they run away with the wrong idea that happiness consists only in enjoying the objects of senses. That is why they hanker after them and strive to attain them. And when they find themselves balked in their efforts, they are seized with anger. But as a rule one who is habitually under the sway of lust and anger can never be happy. One who is under the sway of anger will allow himself to commit all sorts of mischief's and vice - the former for the sake of a wife, progeny, wealth and honour, etc. and the latter with a view to harming others. They thereby expose themselves to illness, grief, ignominy, infamy, perturbation, unrest, anxiety and various kinds of agonies in this world.

शक्नोतीहैव य: सोढुंप्राक् शरीरविमोक्षणात् ।
कामक्रोधोद्भवं वेगं स युक्त: स सुखी नर: ।।

5/23 Bhagavad Gita

He alone who is able to stand in this very life the urges of lust and anger is a yogi and he alone is a happy man.

He who lives a holy life with his gentle and peaceful conduct, is said to be truly living in this world and no other.

समयाशमशालिन्या वृत्या यः साधु वर्तते ।
अभिनन्दितया लोके जीवतीह स नेतरः ॥

Yoga Vasistha Mumuksu Prakarmna, Sloka 70

We have to remember one thing today, the maladies, difficulties and distress which mankind is facing throughout the world, are spiritual in nature. That is why medical science has almost failed; that is why psychology has almost failed; that is why technological wealth and prosperity have almost failed. That is why most civilized, organized disciplines and political orders have almost failed, because the malady that man is suffering from today is spiritual. It is related to the quality of his mind; it is related to the quality of his soul; it is related to the quality of his philosophy.

Love and Affection for People to Achieve Peace

परिक्षीणे मोहे विगलतिधाने ज्ञानजलदे परिज्ञाते तत्वे समधिगतात्मन्यतितते ।
विचारर्यायैः सार्द्ध चलितवपुषो वै सदृशतो घिया दृष्टे तत्त्वे रमणमटनं जागतमिदम् ॥

Yoga Vasistha Mumuksu Prakarna, Book 2, Sloka, 20

In Isavasya Upanisad, Sloka 6 it has been advised that the wise man who perceives all beings as not distinct from his own self at all and his own self as the self of everything he does not by virtue of that perception hate anyone. Love and emotions are a great strength and source of tremendous power. Swami Vivekananda has beautifully put, "If there is a conflict between the intellect and the heart, always follow heart" the above mentioned teaching has to be perfected through constant use to achieve excellence. To quote Swamiji Vivekananda, "the various feelings in the human heart are not wrong in themselves; only they have to be carefully controlled and given a higher direction, until they attain the very highest condition of excellence."

Selfless Services

Swami Harshanand says that Ask nothing; want nothing in return. Give what you have to give; it will come back to you - but do not think of that now. It will come back multiplied a thousand fold - but the attention must not be on that. Yet have the power to give; give , and there it ends.

इष्टान् भोगान् हि वो देवा दास्यन्ते यज्ञभाविताः ।
तैर्दत्तानप्रदायैभ्यो यो भुङ्क्ते स्तेन एव सः ॥

3/12 Bhagavad Gita

When the Creator said that fostered by sacrifice, the gods would surely bestow on man all the desired enjoyments unasked, he meant that, for his own part; man should go on scrupulously performing his duty. If man did not fail in the performance of his duty, there could be no doubt that fostered and nourished by his sacrifice, the gods could ever continue to supply him with all the means of leading a happy and contented life; for the gods were bound to perform their part of duty.

The essence of the spirit of service is contained in the following words of Vivekananda: "This is the gist of all worship—to be pure and to do good to others. He who sees Shiva in the poor, in the weak, and in the diseased, really worships Shiva; and if he sees Shiva only in the image, his worship is but preliminary. He who has served and helped one poor man seeing Shiva in him, without thinking of his caste, or creed, or race, or anything, with him Shiva is more pleased than with the man who sees Him only in the temples. He who wants to serve the father must serve the children first. He who wants to serve Shiva must serve His children must serve all creatures in the world first.

Self Introspection and Self-understanding to make Ourselves Perfect

Man, therefore, according to Vedanata philosophy, is the greatest being that is in the universe, and this world of work the best place in it, because only herein is the greatest and the best chance for him to become perfect. Angles or gods, whatever you may call them, have all to become men, if they want to become perfect. This is the great center, the wonderful poise, and the wonderful opportunity—this human life.

न विचारं विना कश्चिदुपायऽस्ति विपश्चिताम् ।
विचारादशुभं त्यक्त्वा शुभमायाति धीः सताम् ॥

Yoga Vasistha Mumuksu Prakarana, Book 2, Sloka 5

There is no expedient for the learned and wise except reason; it is by means of reason that the minds of good people can avoid evil and secure their good.

युक्तायुक्त महादीपमभिवांछितसाधकम् ।
स्फारं विचारमाश्रित्य संसारजलधिं तरेत् ॥

Yoga Vasistha Mumuksu Prakarna, Book 2, Sloka 7

Reason is the lamp to show us the right and wrong, and the instrument for accomplishment of our desires:- by reliance on right reason, one crosses over easily the wide ocean of the world

सन्तुष्टिपरतृप्तस्थ महतः पूर्णचेतसः ।
क्षीराब्धेरिव शुद्धस्य मुखे लक्ष्मीर्विराजते ॥

Yoga Vasistha Mumuksu Prakarna, Book 2, Sloka 7

The negative conception of moksa as merely freedom from all kinds of pains and experiences, has become a target of criticism by all other schools of Indian philosophy particularly Vedanta. Many points may be said against the Nyaya-vaisesika conception of moksa. First of all, we may point out that Nyaya-vaisesika philosophers cannot explain the bondage of the soul satisfactorily. How is soul originally bound? Nyaya-vaisesika philosophers do not advance any consistent hypothesis like the maya of sankaṛa, which may satisfactorily explain that the bondage is beginningless. Secondly, the approach of the Nyaya-vaisesika being a thoroughly realistic one, they do not make the distinction between the empirical truth and the transcendental truth. They believe that the bondage of the soul is absolutely real. But we fail to understand that if the bondage is real, how it can be removed. Real is that which is never negated. If we believe in the reality of bondage, we are forced to the conclusion that moksa is impossible. The satisfactory position would have been to believe that the bondage is real only empirically. But the out and out realistic approach prevents them to develop the system in this direction

According to Nyaya-vaisesika, the soul in the state of liberation only exists, devoid of any experience. It has neither bliss nor consciousness. According to them, these are adventitious qualities of soul, so they should be disjoined in the state of liberation. But, it is interesting to note that they do not grant any of the six perfections, possessed by God Himself in their fullness, to the liberated soul. These perfections are also qualities, and if God possesses certain qualities, why the liberated soul should not be granted those qualities in their perfect form? Does not this lead to the absurd conclusion that God, as He is having certain qualities, is eternally bound?

The view of Nyaya-vaisesika that liberation takes some time even after the attainment of right knowledge and that Jivanmukti is not possible, is also objectionable. If bondage is due to ignorance, it should be instantly removed when the right knowledge has been attained. We fail to understand why there should be some interval between the rising of the sun and the removal of the darkness.

The negative concept of moksa of Nyaya-vaisesika is not tenable at any rate. The reason why Nyaya-vaisesika rejects all pleasures in liberation is that the analysis of every day experience shows them that they are not unmixed. They are immediately followed by pains. We may say that this reason, no doubt, is true for worldly pleasures but not for the bliss experienced in liberation. There are certain Sruti passages, which clearly tell us that the knower of Brahman becomes Brahman himself. This shows that according to Sruti, the liberated soul enjoys oneness with Reality, and enjoys sat, cit, ananda, pure existence, pure consciousness and pure bliss with Brahman. Thus, in rejecting the liberation as a blissful and conscious state Nyaya-vaisesika comes in conflict with Sruti. Again, it does not appeal to reason that the atman in the state of liberation, should simply exist, devoid of any experience like a stone.

And even if it be granted that all pleasures are followed by pains, it is not wise to reject some pleasures only because of the fear that they will be followed by pains. Something is better than nothing. The criticism of the author of Syadavadamanjari appears to be quite correct that even worldly life is far better than the Nyaya-vaisesika liberation, because, in worldly life, we have some pleasures, may they be at intervals, but the Nyaya-vaisesika state of liberation has not even these pleasures.

A devotee of Krsna prefers to live in the forests of Brndabana as a jackal than to enjoy the liberation of Nyaya-vaisesika. Srihartha jokes beautifully when he writes that the Slitrakaras of Nyaya and Vaisesika have been rightly named for giving such a crude conception of moksa.[26]

Though we have criticized the Nyaya-vaisesika conception of moksa, it may be said that being the realistic system, Nyaya-vaisesika adopts such a conception of moksa. The root of such conception seems the very approach of the Nyaya-vaisesika. The realistic approach and the application of reason to the experience of liberation puts the joint-system in such a condition. But as unity amidst diversity is the aim of philosophy, Nyaya-vaisesika represents the first stage in the development of the orthodox Indian thought. According to it, the liberated soul only exists, devoid of any consciousness and bliss; according to Samkhya-Yoga, the liberated soul enjoys consciousness also; according to Vedanta, the liberated soul enjoys. Thus, the Nyaya-vaisesika conception of liberation represents only the first stage in the development of the conception in the orthodox schools of Indian philosophy.

A right education can play a great role in attaining Moksa and the resultant harmonious environment where there will be no jealousy, no interpersonal conflicts, complete knowledge of life—a *sine-qua-non* for good environment. Radha Kumar Mookerji in his Article "Ancient Education" in Vol. II (Cultural Heritage of India, 2001), rightly suggests the role of education in achieving Mukti and resultant good environment. To quote:[27]

> Education was thus based upon an individual treatment of the pupil by his teacher, with whom he must live to give full scope to it. The pupil was to imbibe the inward method of the teacher, the secrets of his efficiency, the spirit of his life and work, and these things were too subtle to be taught. This individual treatment was all the more essential where the supreme purpose of education was the attainment of the highest, saving knowledge leading to mukti (liberation).

Moksa also advocates the attainment of one's own real and essential nature which is never in conflict with environment, rather it reinforces the positive developments of moksa.

Roma Chaudhry in an article, "The Nimbarka School of Vedanta"[28] in Vol. II, Cultural Heritage of India stresses that Moksa or salvation means realizing our essential similarity with the Lord. When, the soul in bondage attains a direct vision of the Lord, it attains His nature and most of His attributes, and this is freedom from the cycle of births and rebirths and the consequent, infinitely miserable mundane existence.

But such an attainment of the nature of Brahman is only one element in moksa. The other equally important element is the attainment of one's own real and essential nature. Attaining the nature of Brahman means, as pointed out above, becoming similar to and never identical with Brahman.

Indians believe in ultimate values—truth, beauty and goodness "they believe and maintain the rationality of cosmos. They practice Moksa to keep the environment and cosmos in perfect order to better their own lives as well as a better universe. To quote M. Hiriyamma philosophy of values."[29]

The question that now remains to ask is whether such an ideal can be achieved at all. In one sense, the question is not legitimate, because moksa, standing as it does for a progressive attainment, is being realized at every stage. But it may be taken to mean whether the process of self-realization is an endless one or has a culminating stage; and if it has such a stage, whether it is attainable. All the Indian systems, including the non-Vedic ones, are of opinion that this process is directed to a definite goal, and that goal can assuredly be achieved.

Hence, though the final aim of life or the ultimate value is here stated to be self-realization, it is really very much more, for it also signifies doing one's utmost to secure universal good.

Thus, Moksa and harmonious environment physical, mental, social and spiritual are directly related and hence, all of us should make efforts to follow ideal values to avoid degeneration of environment.

Our consistent and persistent efforts would solve our petty problems of this physical world, once we are determined to enter into the realm of God. All experts and scholars should examine this aspect so that all problems like ozone depletion, deforestation, pollution of water, air, etc. can be solved. In addition, people can lead a peaceful life on this planet.

Transformation of Individuality into Personality, thus, is an essentiality for spiritual growth, for the manifestation of all possibilities lying latent in the man. When this happens excellence naturally comes in its trail. When an action is performed keeping an eye on the benefit that is supposed to accrue to the doer of the act, it does not attain that height which entitles it to gain appreciation as "excellent." When, however, it is performed without any desire,—with an attitude of doing service to the nation or to the community, it turns out to be an excellent action. Personality thus is closely linked with the concept of excellence. Shrimad Bhagavad Gita, therefore, tenders advice to posterity to perform action without any selfish motive and to go on extending the barriers of personality, so that tiny ego is put into slumber and spiritual development of the man takes place. In a remarkable verse the Gita proclaims; the Yogi is far superior to the mendicant,—to the scholar, to the worker and consequently what is required is the mentality to perform action, surrendering all the fruits of such action at the alter of the community. The man in whose mind the thought of self interest remains prominent can never reach the height of excellence. Spiritual intelligence is always to be regarded as the supreme guide in all human exercises, because it is this spiritual intelligence that leads to fulfilment of human march; it is this spiritual growth, which enables the man to discharge his obligations to the community in an excellent manner.

Dr. S.S. Gupta has rightly said that our Rishis were social scientists par excellence and their social science included all the disciplines. Dr. Gupta suggests the following to improve human excellence:[30]

(i) The individual is the central point of the society and also the nation. So there should not be any scope of a conflict between interests of individuals, the society and the nation. There should be complete homogeneity and uniformity among the three. In the western thought this uniformity and homogeneity is missing. In socialist literature conflict is an essential ingredient.

(ii) That life is one whole. It should not be divided into watertight independent segments like social, political, economic, etc. By doing so, an invitation is given to tensions and split of life which will become competitive instead of complimentary.

(iii) That the perfect coherence between individuals, between different segments of life and between individuals and these segments is possible when the guiding principles (or fundamentals of all are same and not different. Today we find different guiding principles of all these segments of life and no competition and conflicts among them. This is leading to growing tensions in individuals and their split personalities.

(iv) That the guiding principles of the entire life, which can promote simultaneously, the happiness of individuals, the whole society and the world, should be natural, scientific and achievable. The Rishis-*cum*-social scientists of India gradually developed them and called them human-values of social values such as truth simplicity, self-control, purity, non-stealing, non-anger. The number of these basic principles was not static. It went on changing as per the needs of time and new researches.

(v) That the sum total of these guiding principles will be called Dharma, which is distinct from the rituals of religion. It is unfortunate that today people, specially the politicians and even so called scholars do not understand the meaning of Dharma and confuse it with religion. The ancient Rishis-*cum*-social scientists explained the meaning of Dharma. They gave it multi-dimensional meaning. One important meaning was that every thing has a nature, i.e. Dharma. For example, fire has a Dharma (Nature) to burn and air has a Dharma to blow. Similarly, the Dharma of the people of the world should be these basic Human-values. So, by Dharma, they meant a code of conduct. Certainly, this is not Religion.

S. Radhakrishnan in "the Bhagavad Gita" has beautifully explained the path to achieve excellence:[31]

How is the goal of perfection to be attained? Samsara is historical becoming. It is the temporal (Katha Upanisad, Vol. II, p. 10) procession of changes from one state into the next. What keeps the world going is action of karma. If the world is nothing but ebb and flow, continual becoming, it is due to action. At the human level action is caused by desire or attachment, kama the root cause of desire is avidya or ignorance of the nature of things. The roots of desire lie in the ignorant belief in the individual's self-sufficiency, in the attribution of reality and possible to escape from the vicious circle of becoming. We cannot cure desires by fresh desires; we cannot cure action by more action. The eternal cannot be gained by that which is temporal. Whether we are bound by good desires or bad desires, it is still a question of bondage, it makes a little difference whether the chains which bind us are made of gold or of iron to escape from bondage we must get rid of ignorance, which is the parent of ignorant desires and so of ignorant actions. Vidya or wisdom is the means of liberation from chain of avidya kama karma.

Wisdom is not to be confused with theoretical learning or correct beliefs, for ignorance is not intellectual error. It is spiritual blindness. To remove it, we must cleanse the soul of its defilement and kindle the spiritual vision. The fire of passion and the tumult of desire must be suppressed (Katha Upanisad, Vol. IV, 39). The mind, inconstant and unstable, must be steadied so as to reflect the wisdom from above. We must control the senses, possess the faith which no intellectual doubts, disturb and train the understanding (buddhi). (Katha Upanisad, Vol. II, p. 94)

Wisdom is direct experience which occurs as soon as obstacles to its realization are removed. The effort of the seeker is directed to the elimination of the hindrances, to the removal of the obscuring tendencies of a vidya. According to advaita vedanta, this wisdom is always present. It is not a thing to be acquired; it has only to be revealed. Our casual apprehensions, backed by our wishes and prejudices, do not reveal reality. Utter silence of the mind and the will, an emptying of the ego produces illumination, wisdom, the light by which we grow into our true being. This is life eternal, the complete fulfilment of our capacity of love and knowledge, the completely simultaneous and perfect possession of unlimited life at a single moment, to use the words of Boethius.

Jnana and Ajnana, wisdom and ignorance are opposed as light and darkness. When wisdom dawns, ignorance dies and the evil is cut-off at the root. The liberated soul overcomes the world. There is nothing to conquer or create. Action no more binds. When we grow into this wisdom, we live in the Supreme. This consciousness is not an abstract one. It is that by which thou shall see all existences without exception in the self, then in me. The true human individual pursues this ideal of perfection with a devotion similar to that which he offers to an adored woman. (Muktikanta)

Perfection at the human level is a task to be accomplished by conscious endeavor. The image of God operating in us produces a sense of insufficiency. Man has a haunting sense of the vanity, the transience and the precariousness of all human happiness. Those who live on the surface of life may not feel the distress, the laceration of spirit, and may not feel any urge to seek their true good. They are human animals (purusapasu), and like animals they are born, they grow, they mate and leave offspring and pass away. But those who realize their dignity as men are acutely aware of the discord and seek a principle of harmony and peace.

To quote S. Radhakrishnan again:[32] Human nature has immeasurable potentialities and the world process has no predestined goal. The power of free choice gives us hope for the future. We can remake the world. Whatever flaws of character or deficiencies of mind we have we can remove them. If we strive to do so, the forces of the universe will assist us. We can consciously direct the process of human evolution. Nature comes to its fulfilment in the human individual, who is the bearer of the creative process. He is the unique representative of the universe in whom the unconscious creativity of nature becomes conscious creativity. The inner discord means that he can contend with the disruptive forces, conquer them and attain peace.

Moksa also advocates the attainment of one's own real and essential nature which is never in conflict with environment, rather it reinforces the positive developments of moksa. The question that now remains to ask is whether such an ideal can be adueved at all. In one sense, the Question is not legitimate, because moksa, standing as it does for a progressive attainment, is being realized at every stage. But it may be taken to mean whether the process of self-realization is an endless one or has a culminating stage; and if it has such a stage, whether it is attainable. All the Indian systems, including the non-Vedic ones, are of opinion that this process is directed to a definite goal, and that goal can assuredly be achieved.

Hence, though the final aim of life or the ultimate value is here stated to be self-realization, it is really very much more, for it also signifies doing one's utmost to secure universal good. Thus, Moksa and harmonious environment physical, mental, social and spiritual are directly relax and hence, all of us should make efforts to follow ideal values to avoid degeneration of environment.

Our consistent and persistent efforts would solve our petty problems of this physical world, once we are determined to enter into the realm of God. All experts and scholars should examine this aspect so that all problems like ozone depletion, deforestation, pollution of water~ air etc. can be solved. In, addition people can lead a peaceful life on this planet.

Narada's teachings for everyday living are valid for all times. Chapter 209 of the Mahabharata Santiparva mentions Anusmritim i.e. cherished reflections exclusive of all other thoughts, narrated by Narada to Bhishamapitamaha. The main instructions in them may be briefly recapitulated as these lead to spiritual knowledge and moksa.

(i) In all of us dwells the Supreme being and all of us in the Supreme being;
(ii) The Supreme being is in everyone, and everything, one must always realize;
(iii) Keep lie body and mind under control through the intellect and let the intellect rest in-the peaceful self;
(iv) Meditate on the Supreme Being with the thought that you belong to Rim, He belongs to you, He pervades the universe;
(v) The Supreme being is beyond the comprehension of the human mind;
(vi) The Supreme Being is also firmly devoted to his devotees;
(vii) Only ease—sacrifices, gifts—and -austerities which are done without expectation of rewards purify the body and illuminate the intellect and illumination of the mind leads to realization;
(viii) Performance of all sites and actions as an offering and service to the Supreme Being should be our attitude;
(ix) A Salutation with complete faith in the Supreme Being even by a wicked person leads to heaven;.
(x) Do not pursue temporary objects, meditate on the Supreme Being for the freedom from cycles of births and deaths;
(xi) Knowledge of Anusmriti should be given to other devotees to free then from fear of births and bondages; and
(xii) There is no gift greatest than the gift of spiritual knowledge.

Indian thought asks us to liberate ourselves from bondage. We must pass from samasara, life in time subjects to discords to moksa or enlightenment or eternal life.

O man
Do not be afraid of performing
Your marital duties
With courage and conviction
Fellow the path of Dharma

Endowed with strength,
Honour and Valour
May you obey
Your god assigned duties
And be happy

—Yajurveda

Moksa consequently, is not a figment of imagination, incapable of being achieved at any stage; it is a reality capable of being obtained through spiritual growth. And the prescription given by Sanskrit Literature on attainment Moksa (Mukti) is surest way.

Notes and References

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CHAPTER 9

NYAYA-VAISESIK AND MODERN SCIENCE

> "India's thought upholds both Religion and Science as Valid Disciplines in the Pursuit of Truth."
>
> —*T.R. Seshadri*

9

CHAPTER

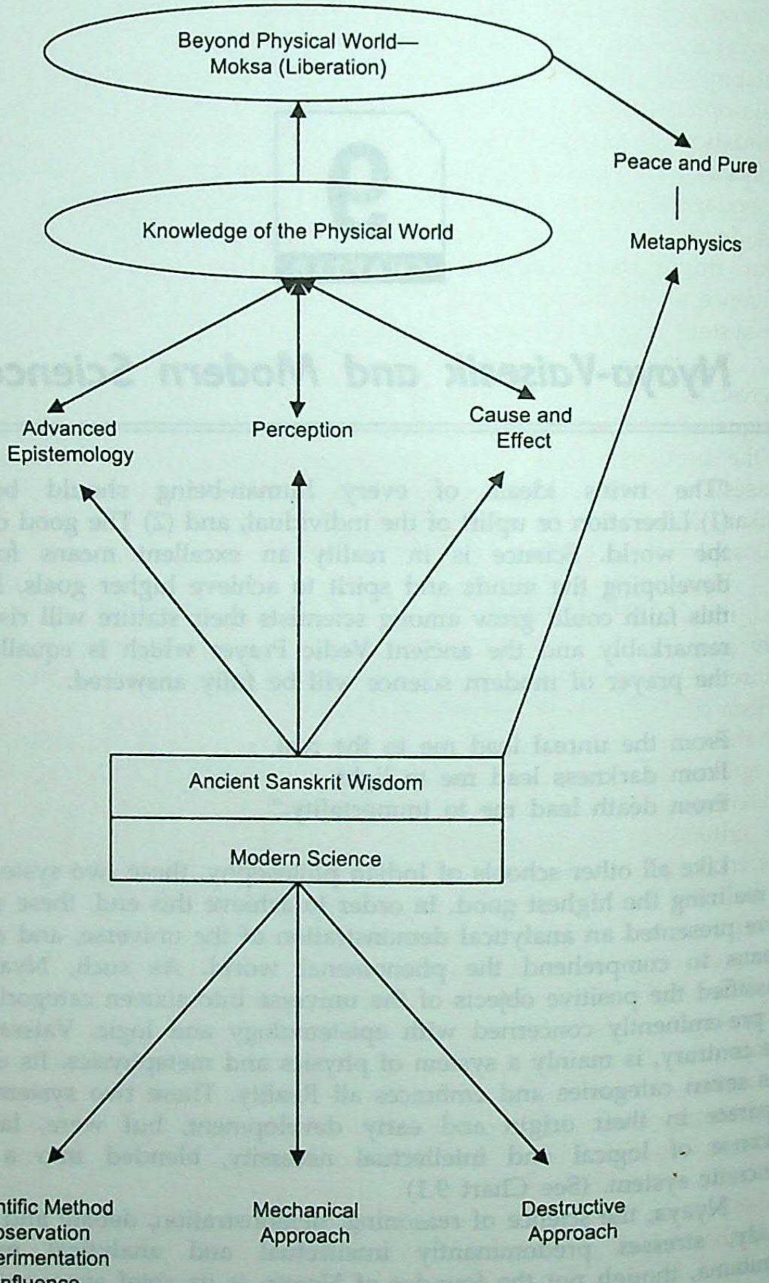
Nyaya-Vaisesik and Modern Science

> "The twins ideals of every human-being should be: (1) Liberation or uplift of the individual, and (2) The good of the world. Science is in reality an excellent means for developing the minds and spirit to achieve higher goals. If this faith could grow among scientists their stature will rise remarkably and the ancient Vedic Prayer which is equally the prayer of modern science will be fully answered:
>
> From the unreal lead me to the real,
> From darkness lead me to light,
> From death lead me to immortality."

Like all other schools of Indian philosophy, these two systems aim at realizing the highest good. In order to achieve this end, these systems have presented an analytical demonstration of the universe, and also the means to comprehend the phenomenal world. As such, Nyaya has classified the positive objects of the universe into sixteen categories, and is pre-eminently concerned with epistemology and logic. Vaisesika, on the contrary, is mainly a system of physics and metaphysics. Its doctrine has seven categories and embraces all Reality. These two systems were separate in their origin and early development, but were, later on, because of logical and intellectual necessity, blended into a single syncretic system. (See Chart 9.1)

Nyaya, the science of reasoning, demonstration, debate and critical study, stresses predominantly intellectual and analytical methods. Gautama, though not the founder of Nyaya, is its chief exponent. He is the first who presented an elaborate and systematic account of the already existing branch of knowledge, called 'Nyaya' and codified it in the form of sutras called 'Nyaya-sutra'. Besides him, Vatsyayana,

CHART 9.1


Beyond Physical World—
Moksa (Liberation)
Peace and Pure
Metaphysics
Knowledge of the Physical World
Advanced Epistemology
Perception
Cause and Effect
Ancient Sanskrit Wisdom
Modern Science
Scientific Method
Observation
Experimentation
Influence
Mechanical Approach
Destructive Approach

Uddyotakara, Vacaspati Misra, Udayanacarya and Jayanta Bhatta are the other important commentators of this system. In the beginning Nyaya (generally known as Old Nyaya) was studied from all angles as Vatsyayana and his successors discussed both the logical and metaphysical problems as well as many other general questions of philosophical interest. But, in the later stage of Nyaya, Gangesa laid the foundation of Navya-Nyaya in his book 'Tattvacintamani'. He treated Nyaya as pure epistemology and logic, divesting it of all its metaphysical appendages. Among the successors of Gangesa, Vardhamana, Jaideva, Vasudeva, Raghunatha, Mathuranath, Jagadisa and Gadadhara are of great importance. These Navya-Nyaya writers made no particular reference to the metaphysical problems in their works and thus reduced the system only to the pramana-sastra.

Vaisesika, on the other hand, is poorer in its epistemological interest as it is pre-eminently a metaphysical system. The system is so designated because, according to it, diversity and not unity is at the root of the universe. This system was founded by Kanada inwriting his 'Vaisesika Sutra'. Prasastapada, Udayana, Sridhara, Vyomasiva and Sankar Misra are the important commentators of the Vaisesika philosophy.

Both the Nyaya and the Vaisesika systems recognize the reality of God; individual souls and minds; physical things; atoms of earth, water, light and air, space, time and ether. They hold the same view of the nature of the individual soul and its liberation. They both propound realism and pluralism. They advocate the similar deistic view of God. But these systems differ from each other in certain respects. First, Nyaya recognizes four means of valid knowledge (pramana), viz., perception, inference, comparison and testimony. Nyaya gives a vivid description of the criteria of truth, validity of knowledge and different kinds of inference and fallacies. It treats the problems of logic and epistemology in the most comprehensive manner. Vaisesika, on the other hand, admits perception and inference only as pramanas and deals with these pramanas in a peripheral way.

Secondly, these systems difference in their treatment of categories. Nyaya recognizes sixteen categories which mostly refer to the basic points of a theory of knowledge. Except pramana and prameya, all the remaining fourteen categories appear merely various headings of chapters in a treatise of logic. These are the sixteen topics which one may study in order to master the details of Nyaya dialectics. As such these topics or categories are not the ultimate ontological categories. The Vaisesika, on the other hand, divides the whole reality into seven padarthas which present an analytical demonstration of this phenomenal world.

From the aforesaid differences, it is obvious that neither system was self-contained. Thus, the combination of the two was a logical and intellectual necessity. We know that in order to understand the theory of

Reality of metaphysics it is necessary to have a theory of knowledge. The knowledge of Reality is possible only through right knowledge. Ignorance is the source of all evils that plague man individually and collectively. Even Socrates and Plato also advocated that virtue is knowledge and the knowledge is the foundation of a philosophic statecraft.[1] Right knowledge is augmented with the help of the knowledge of Reality. Thus, reality and knowledge are intertwined and indispensable in attaining the higher values of life. The combination of these two branches—epistemology and metaphysics—helps us attain the highest values. That is why the systems culminated into one syncretic school Nyaya-vaisesika. The syncretic writers like Annam Bhatta, Visvanatha and Kesava Misra adopted the epistemology of Nyaya-system and accepted the ontological structure of the Vaisesika-system and accepted the ontological structure of the Vaisesika-system. While the Vaisesika represents the positive, constructive or creative side of the combined school, the Nyaya represents its defensive side. In the manuals of the syncretic school, whether primarily belonging to the Nyaya or to the Vaisesika school, all the topics Nyaya-vaisesika philosophy have been explicated. Thus, jointly Nyaya-vaisesika becomes a complete system—the deficiencies of each are made good by the other in a well-rounded synthesis.

Before taking up a critical analysis, it would be useful to summarize the main components of this joint system.

Epistemology

Pramanas, being essential for checking and evaluating the existing knowledge, are the very pivot of the metaphysical quest. In order to comprehend the ultimate reality, Nyaya-vaisesika system has expounded four means of valid knowledge. Among these four means 'perception' is the most primary and fundamental source of knowledge. It is an unerring cognition produced by sense-object contact. 'Inference' is the process of ascertaining, not by perception or direct observation, but through the instrumentality or medium of a mark possessed by a thing. 'Comparison' is the source of our knowledge about the relation between a world and its denotation. 'Testimony' is the statement of an authoritative person, which serves to give us true knowledge about certain objects. Without testimony, we would be deprived of the valuable knowledge that emanates from the scholarly works of specialists and experts. These four pramanas are quite exhaustive in comprehending the knowledge of the ultimate Reality and also embraces all means of valid knowledge propounded by the protagonists of the other Indian philosophical system.

Metaphysics

Kanada divides all nameable things primarily into two classes, viz., existence and non-existence. Objects of the first class are next sub-divided as: (i) substance; (ii) attribute; (iii) action; (iv) generality; (v) particularity; and (vi) inherence. These, including non-existence, comprise the seven padarthas. Substance, attribute and action are further sub-divided under nine, twenty-four and five classes respectively. Generality and particularity together are as many as there are substances, attributes and actions plus the summum genus and the infinite species. Inherence is only one in number.

A substance is neither a bundle of qualities nor a mere idea; instead it is independent, real, objective, substrate of qualities and actions, and material cause of a product. It is of nine kinds—earth, water, fire, air, ether, time, space, soul and mind; and thus incorporates material as well as spiritual attributes. Out of the nine substances, the first five are called physical elements, since each of them possesses a peculiar quality which is perceptible to the external sense. Earth, water, fire and air are of two kinds: non-eternal as composite products, and eternal in the form of paramanu. The composite products are non-existent before their production and also after their destruction. Prior to production and after destruction, all these four substances have a permanent form. Out of this permanent form, every time a fresh product emerges. This is at the root of the theory of Arambhavada expounded by Nyaya-vaisesika.

Earth, water, fire and air are eternal in the form of atoms which are neither created nor destroyed by God. These are coeternal with God. They are the material cause and God is the efficient cause of the world. During the dissolution of the world, the atoms remain motionless. Motion is produced in them, according to earlier Vaisesikas, by adrsta residing in the individual souls; and by God according to later Vaisesikas. These atoms combine in geometrical progression and not in arithmetical one and thus we have this phenomenal world. The atoms of water, fire and air do not change throughout this process. The changes occur only in earth and atoms of earth when objects come in contact with heat.

Ether is the substratum of the quality of sound. It is eternal, ubiquitous and devoid of a genus. Time and space are conceived as objective realities, and they are infinite and are like akasa. Manas is atomic and eternal. Each should has its own manas and the co-operation of the manas is a necessary condition of all knowledge, whether it refers to external objects or internal feelings. Being eternal, it remains attached to every jiva even during the state of cosmic rest. But it does not produce any cognition during that period for want of an organism.

For the clear and thorough understanding of the nature of this physical world, this system believes in the existence of a conscious element (soul), without whose help this objective world cannot exist. This conscious element is of two kinds: the individual soul and the supreme Soul (God). The individual soul is neither a by-product of physiological processes nor identical with the stream of conscious states. It is not ultimately resolvable into the Supreme Soul during the circle of secondary creations and dissolutions. Like ether, time, space, air, and ultimate atoms the soul is not an object of external perception. Nor is it an object of internal perception by ordinary minds. Only persons who have attained a certain level of spiritual development through a particular conjunction of the soul and the mind can have immediate consciousness of the existence and attributes of the soul. Otherwise the proof of the existence and attributes of the soul is merely by inference.

Supreme Soul, i.e., God, is the efficient cause of this world. He fashions the world out of the pre-existing atoms in time and space. He produces motion in the atoms and combines them into dyads, dyads into triads and triads into quartrads and quartrads into more complex things. Thus, God produces diverse effects out of the atoms in the presence of diverse merits and demerits.

The second category of the Nyaya-vaisesika system is 'attribute', which means 'quality'. The characteristic of an attribute is that it naturally inheres in substances, does not contain an attribute in itself and is not an independent cause of conjunction and disjunction. The third category named 'action' presents physical movement. The characteristic of an action is that it inheres in one substance only, does not possess attribute, and is an independent cause of conjunctions and disjunctions. The fourth category named 'genus' is the principle of assimilation and the fifth category named 'species' is the principle of differentiation. For Kanada, genus and species are mental concepts because they are dependent upon intellect. The sixth category 'inherence' is the relation of parts and wholes, of objects and their attributes, of action and that in which it appears, of genus and species and things in which they reside, and of eternal substances and their ultimate differences. It is established by inference. The seventh category is 'non-existence'. The Nyaya-vaisesikas, being realists, believe that just as knowledge is different from the object known which exists independently of that knowledge and necessarily points to some objects, similarly knowledge of the negation is different from the thing negated and necessarily points to some object which is negated. Non-existence is an object of perception. The causal theory of the Nyaya-vaisesika known as asatkaryavada is also based on the reality of abhava.

Moksa

This system expounds that after the true knowledge of these categories, wrong notions about the soul will disappear and it will bring the 'highest good,' i.e., the moksa. Moksa has been defined in this system negatively as the cessation of pain, and not as the enjoyment of positive pleasure. According to this system, in liberation, the soul simply disjoins all its adventitious qualities and assumes its pure form.

Now, let us examine the contribution of the joint-system to the stream of human knowledge. The most important contribution of this system to the Indian philosophy is its logic and epistemology which have been adopted by other systems also with minor modifications. Even the modern Western logic and epistemology have largely accepted them. The epistemology of this joint school is a standing repudiation of the charge that the theories of Indian philosophy are based on religious authority and not on reasoning; and that's why the Indian philosophical theories are dogmatic rather than critical. The sound logic of Nyaya-vaisesika system therefore tries to ascertain the truth of the objects which ultimately leads us to our highest ideal. Dr. Radhakrishnan is right when he says that the epistemology of Nyaya "mapped out the world of knowledge in its essential feature and gave to its main divisions the names which they still retain in Hindu thought, a clear proof of the immense advance, which it won for the human intellect."[2]

Another remarkable contribution of the Nyaya-vaisesika philosophy is its classification of Realities and its atomic cosmology. It recognizes positive as well as negative facts, both of which are said to be equally real and objective. The scheme of categories developed by Dr. Christoph Sigwart in his logic is quite akin to that of Kanada.

The emphasis on the principle of negation marks the distinctive pluralistic tendency of the Nyaya-vaisesika. The problem of negation is a problem of modern logic. The four kinds of non-existence have metaphysical significance. Without prior and posterior non-existence, things would be eternal. If there were no mutual non-existence, things would be indistinguishable from one another. If there were no absolute non-existence, things would exist always and everywhere. The Nyaya-vaisesika's recognition of non-existence is another advance in the field of speculation.

The recognition of generality as the basis of assimilation and of particularity as the basis of discrimination, presents a scientific view of the universe. Material things existing in time, space and ether are connected with one another by finding out their particularities and generalities. Ultimate individualism or particularity of eternal substances is of great advance in philosophical thought. This system is the precursor of the modern concept of individualism.[3] It has been advocated in the recent times by writers like Tolstoy, Mahatma Gandhi, J.S. Mill, etc. the science of biology has also confirmed the same. No two individuals are alike, as the genes, the basis of character of an individual, vary in individuals.

The atomic theory of this joint-system is an improvement on the common view of the world as constituted by the physical elements of earth, water, air and fire. It is also an improvement on the materialistic theory that all things, including life, mind and consciousness, are transformulations and mechanical products of material atoms. The Vaisesikas harmonize the atomic theory with the moral and spirituals aspects of life and theistic faith in God as the creator of the world.

The greatest discovery of human thought is the realization of a link between cause and effect. The evolution of science is based on the implicit faith in the law of causation. The scientific study means the search of a cause or a number of causes leading to a particular phenomenon. In the history of Indian thought, Kanada's is the pioneering attempt to explore a relation between cause and effect. This was later on developed in a modified form by the Samkhya School, and more critically examined by the Buddhistic School and the Vedantins.

This joint-system is in tune with the modern knowledge of science. We have illustrated at some places in this monograph the facts that the modern knowledge of science and technology was already existing in this joint-system. The purpose of the comparison of this joint-system with that of modern science is not to prove that the propounders of the joint-system were the predecessors of the modern knowledge of science. Our purpose is only to understand the reality of this universe. Anyhow, it may be inferred that the basic assumptions of the joint-system present the reality in a more meaningful way than does the modern science. The modern laws of science pertaining to gravitation, viscosity, motion, conservation of energy, physical change, chemical change, chemical action, etc., had already been explained in the philosophy of this joint-system. The scientists have discovered electrons, protons, etc., to give a better explanation of this physical universe. We have already examined in Chapter V that this is in no way an advancement over the tenets of this joint-system. Rather, the joint-system points out that there is an unlimited energy hidden in the elements, of which we know only a little. It needs a great effort to unearth this knowledge and bring it to the notice of modern scientists and technologists. The Government of India must encourage and increase the tempo of research in this direction.

India in ancient times was at the height of its glory in all the branches of knowledge. Scholars from all over the world used to come to get education in India, but today, paradoxically, Indians are building modern India on the ideology of Western knowledge and philosophy. This has created conflicts, tensions and degeneration in life. The Indians, by adopting the materialistic concept of life, are far away from spiritual Reality and consequently this has created a crisis of character. The concept of liberty and freedom popular in foreign countries satisfies only man's physical wants and aspirations but the concept of moksa, propounded by this system, leads to complete happiness, the summum bonum of life. The noble adventure of planned development on which the country has launched since independence has highlighted the demand for scientific and technological knowledge in the national context. But today, there is a dichotomy between the scientists and Sanskrit scholars. The Governments of our country at the Central and State levels would have to strive hard to encourage the scientists to study the ancient Sanskrit literature like the Nyaya-vaisesika system as we have already examined in Chapter V that this system is the forerunner of the most of the present-day scientific knowledge. For this purpose it would be useful to popularize the learning of Sanskrit. In this way, we would be able to build our modern Bharat true to her ideology.

Though the joint-system has contributed a lot to the advancement of the knowledge of Reality, yet there are certain contradictions inherent in the system. We would now examine some of the major weak points in this system.

An ideal philosophic theory should order and organize the manifold characters into a coherent and intelligible whole. The joint-system attempts to present in one system the features and interrelations of all that is observed. It does not give us a systematic philosophy of the world in its entirety in the light of one universal absolute principle. By advocating for all things a self-identity, the joint-system has not been able to live to the conception of a true spiritual whole, where the reciprocal exclusiveness of parts is overcome. This system is not faithful to the conception of knowledge as an organized whole. We can, therefore, say that the philosophical position of the joint school is lower than that of the Samkhya or the Vedanta.

As already explained, 'substance' is one of the seven padarthas recognized by this system which has been defined as the substratum of qualities and actions. So qualities and actions have no independent existence. If qualities and actions have no independent existence, how can we accept them as independent categories/ We find no answer to the question as to why qualities which possess other qualities, like number, etc., should not be included under substances. Sankara also criticizes this view of the relation between substance and quality. He argues that if the two are inseparably related, the inseparability must refer to place, time or nature. The two are not inseparable in place and time. If it is inseparability in nature or character, then it would be impossible to make further distinction between substance and quality, since the two are one.[4] The Samkhya also admits substance and quality as possessing the same reality while Advaita Vedanta looks upon the conception of substance as an illogical one representing a mode of thought.

The Nyaya-vaisesika fails to explain the nature of particularity. What, for example, differentiates a particular should from others, is not explained. Individual souls never lose their identity. They retain their identity and unique individuality even in the state of liberation. But what is unique or distinct about them is not made clear.

The theory of samavaya is a weak link in this joint-system. We can look upon samavaya as a relation between two different things and yet regard it as of a different kind from samyoga or conjunction. If samavaya is different from samyoga, then the whole is something over and above the parts. The Nyaya-vaisesika itself admits that a substance is free from qualities at the first moment of its production. Hence, it is independent of qualities which depend on it. Here we find an inherent contradiction in the tenets of this philosophy.

The Nyaya-vaisesika system could not build the atomic hypothesis objectively. The 'paramanus'—on which the atomic theory is based—fail to explain the concrete experience built on them. The establishment of the world is expounded by the diversity of atoms. But exclusively external and accidental relations cannot justify the established character of the world.

The joint-system divides things into classes which, it supposes, have been there ever since the world came into existence and will continue till the world comes to an end. This is against the concept of development and social change. We have got evidences to prove the evolution of species from simple to complex. Darwin's theory of evolution shakes our belief in the fixity of species. In order to survive, the species develop individual differences under natural selection. Mendelian heredity may transform the nature and character of a horse beyond identification. Cross-breeding is bringing about great changes in class structure. But, this theory provides no scope and answer to such changes and developments in the social fibre.

The conception of individual soul as essentially unconscious is refuted by the evidence of our direct experience which displays the self as an essentially conscious subject. Even if we admit that the mind or the empirical consciousness is not the real self, still it is not possible to explain the mental phenomena or the empirical consciousness without admitting that the real or the nominal self is an essentially conscious and intelligent reality.

The Nyaya-vaisesika idea of God as wholly immanent to and separate from man and the world is not in consonance with a deeply religious view of life and the genuine religious consciousness of communion with God. This system does not consider God as immanent in the individual souls. God is external to them and directs them, supervises their merits and demerits, and helps them to produce their consequences in the hope of enjoyments and sufferings. The concept of God as the efficient and not the material cause of the world has a clear reference to human relations and reduces God to the position of a human deviser who shapes things out of the given stuff. God relates the world and the individual souls to each other in a mechanical manner. But this is not a logical theism. It does not link the world, soul and god in a coherent order. It does not present a systematic account of the world encompassing one universal absolute principle. It would have been more legitimate to hold that God creates the universe out of His nature, nourishes it by His will and ultimately reabsorbs it in Himself. It would have also been more relevant to hold that God is transcendent in the finite souls as their inner controller; there is no absolute difference in them, but there is identity in difference between them.

The negative concept of liberation as merely freedom from all kinds of pains and experiences propounded by this joint-system is also open to criticism. Liberation cannot be approached by the analysis of every-day experience as is contemplated in the Nyaya-vaisesika system.

It is not possible to comprehend liberation by the realistic approach and reasoning alone. If the souls is devoid of all kinds of experiences, including consciousness, what is the difference between a stone and a liberated soul/ But if the purpose of philosophy is to seek unity amidst diversity, then Nyaya-vaisesika represents only the first stage in the development of the orthodox Indian thought. Nyaya-vaisesika admits the seven realities while Samkhya-yoga and Vedanta accept only two and one Reality respectively. Besides, according to Nyaya vaisesika, the liberated should exists without any consciousness and bliss; according to Samkhya-yoga, the liberated soul enjoys consciousness only; according to Vedanta, the liberated soul enjoys both consciousness and bliss. Thus Nyaya-vaisesika is only the first stage towards the philosophical end while the Samkhya-yoga and Vedanta represent second and third stages respectively.

We may quote here Dr. Radhakrishnan who has nicely summed up in these lines the good and bad points of the joint-system:

"The defect of the Vaisesika is that it does not piece together its results into a single coherently articulated structure. It is not a philosophy in the sense implied by the famous saying of the Republic that he who sees things together is the true dialectian or the philosopher. A catalogue of items is not a systematic philosophy. The many-sided context of human life is ignored by the Vaisesika, and its physical philosophy and moral and religious values are not worked into a unified interpretation. An atomistic pluralism is not the final answer to the intellectual demand for a rational interpretation of the universe. But we agree with the Vaisesika in thinking that the refined analysis of the mere logician gives no more than a science of the possible, an abstract formalism dissociated from the real world. Philosophy may criticize but cannot cut itself loose from common sense. Common sense may not be all, but it is certainly the first condition of all fruitful philosophy."[5]

In view of the above analysis, we can safely conclude that the joint-system was a water-shed in the Indian philosophical thought. Despite its inherent contradiction and blemishes, there can be no denial of the fact that this joint-system has contributed a lot to the advancement of knowledge. The major contribution of Nyaya-vaisesika system lies in explounding a new perspective and complexion of the physical universe and ultimate Reality. This system is both ancient and modern, as it comprises the principles of ancient philosophy and modern science. The method of enquiry propounded by the system is analytical and critical which is the same as physical and social scientists have adopted. Like other philosophical systems, it has been promoting good life leding to real freedom—moksa. The fantastic achievement of modern science and technology in the past few years cannot conceal the fact that man suffers from deep contradictions and dichotomies—gaps between knowledge and wisdom; and between thought and action. The only answer to the present crisis fermenting in the world is the teaching, research and practice of the tenets of the Indian philosophical systems, especially the Nyaya-vaisesika system.

NOTES AND REFERENCES

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2. Dr. S. Radhakrishnan, Indian Philosophy, Vol. II, p. 173.
3. Ilyas Ahmad, The Machinery of Government, Allahabad Publishing House, 1957, pp. 330-33.
4. Sankara Bhasya, 2.17.
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APPENDIX 9.1

ATOMISM IN SCIENCE

Man's curiosity is proverbial, and ever since the dawn of civilization he has been trying to understand the changes going on in the world around him. By and by, he began to think more seriously about them and make enquiries into their nature. As a result, he gradually began to acquire knowledge of nature and her ways. A time came when the knowledge was supplemented by experiments properly classified and systematically arranged. It then came to be known by the name of science. This systematized store of human knowledge, gained after generalizing and inter-relating the various isolated facts, is termed science. Science embraces the sum total of human knowledge ranging over the whole nature and organized into a system. Science, therefore, aims at devising a model of the universe that will explain all that goes on in it and also predict its, future behaviour. Science has been divided into various branches like Chemistry, Physics, Geology, etc. Chemistry is concerned with the composition of matter and the transformation it undergoes. Physics deals with properties of matter and of energy. It is studied under various Sub-heads like mechanics, heat, light, electricity, magnetism and sound. Geology is the science of earth. Thus, ultimately, all sciences deal with matter.

Matter means anything which occupies space and possess weight. Chemically, matter can be sorted into two main groups: substances (including both elements and compounds) and nurtures. An element is a pure substance that cannot be decomposed into simpler substances by ordinary chemical means, e.g., gold, iron, hydrogen, oxygen, etc. There are 105[1] elements, of which 89 have so far been found to occur naturally. The remaining 16 have been produced synthetically by nuclear reactions. Minute amounts of some of these may also exist naturally. The latest element (105) be reported is Hahnium, reported by a group of American scientists at the University of California, Berkeley, in 1970[2] (the name of the element has not been officially designated). A compound may be defined as a substance which is formed by the chemical union of two or more elements in a definite proportion by weight while a mixture is formed by mixing two or more elements in any ratio.

Modern Atomic Structure

In the early part of the nineteenth century, the English scientist John Dalton (1767-1844) proposed an atomic theory based on experimentation -and chemical laws known at that time. He postulated

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1. For the list of 105 Elements, see Periodic Table of the Elements.
2. William S. Seese and Guido H. Daube, Basic Chemistry, Prentice-Hall of India, 54-55.

PERIODIC TABLE OF THE ELEMENTS

GROUPS

TRANSITION ELEMENTS

PERIODS	IA	IIA	IIIB	IVB	VB	VIB	VIIB	VIII			IB	IIB	IIIA	IVA	VA	VIA	VIIA	O
1	1.0080 **H** 1																	4.003 **He** 2
2	6.940 **Li** 3	9.012 **Be** 4											10.81 **B** 5	12.011 **C** 6	14.007 **N** 7	15.999 **O** 8	18.998 **F** 9	20.183 **Ne** 10
3	22.00 **Na** 11	24.31 **Mg** 12											26.98 **Al** 13	28.086 **Si** 14	30.974 **P** 15	32.064 **S** 16	35.452 **Cl** 17	39.948 **Ar** 18
4	39.102 **K** 19	40.08 **Ca** 20	44.956 **Sc** 21	47.90 **Ti** 22	50.942 **V** 23	51.996 **Cr** 24	54.94 **Mn** 25	55.85 **Fe** 26	58.93 **Co** 27	58.71 **Ni** 28	63.54 **Cu** 29	65.37 **Zn** 30	69.72 **Ga** 31	72.59 **Ge** 32	74.92 **As** 33	78.96 **Se** 34	79.91 **Br** 35	83.80 **Kr** 36
5	85.47 **Rb** 37	87.62 **Sr** 38	88.905 **Y** 39	91.22 **Zr** 40	92.91 **Nb** 41	95.94 **Mo** 42	99* **Tc** 43	101.07 **Ru** 44	102.905 **Rh** 45	106.4 **Pd** 46	107.870 **Ag** 47	112.40 **Cd** 48	114.82 **In** 49	118.69 **Sn** 50	121.75 **Sb** 51	127.60 **Te** 52	126.90 **I** 53	131.3 **Xe** 54
6	132.91 **Cs** 55	137.37 **Ba** 56	**La-** **Lu** 57-71	178.49 **Hf** 72	180.948 **Ta** 73	183.85 **W** 74	186.2 **Re** 75	120.2 **Os** 76	192.2 **Ir** 77	195.09 **Pt** 78	196.967 **Au** 79	2200.59 **Hg** 80	47.90 **Tl** 81	207.19 **Pb** 82	208.98 **Bi** 83	210* **Po** 84	210.0* **At** 85	222* **Rn** 86
7	223* **Fr** 87	226* **Ra** 88	**Ac-** **Lr** 89-103	[(201)] [**Rf**] 104	[(260)] [**Ha**] 105													

Lanthanum Series	138.91 **La** 57	140.12 **Ce** 58	140.907 **Pr** 59	144.24 **Nd** 60	145* **Pm** 61	150.35 **Sm** 62	151.96 **Eu** 63	157.25 **Gd** 64	158.924 **Tb** 65	162.50 **Dy** 66	165.93 **Ho** 67	167.26 **Er** 68	168.934 **Tm** 69	173.04 **Yb** 70	174.97 **Lu** 71
Actinium Series	227.0* **Ac** 89	232.038 **Th** 90	231* **Pa** 91	238.03 **U** 92	237* **Np** 93	244* **Pu** 94	243.0* **Am** 95	245* **Cm** 96	247* **Bk** 97	249* **Cf** 98	364 **Es** 99	263 **Fm** 100	284 **Md** 101	254* **No** 102	257* **Lr** 103

Numbers below the symbol of the element indicate the atom numbers. Atomic masses, above the symbol of the element, are fused on the assigned relative single mass of °C as exactly 1.2 ( ) . Indicate the mass nymbers of the isotope with the longest half-life. [ ] indicates not officially.

that matter is made up of tiny, discrete, indivisible and indestructible particles called atoms These atoms maintain their identity throughout physical and chemical changes. This concept of Dalton was not disputed until 1881 when Helmholtz made the conclusion from the Faraday's law of Electrolysis that both positive and negative electricity were divided into definite elementary portions called'atom of electricity. From 1881 onwards, intensive study of electrical conduction in gases was made by scientists like Thomson, Rutherford's Bohr, and Chadwick which led to the discovery of free electrons, protons and neutrons and conclusion was drawn that these are the fundamental particles of atom. Again, in the 3rd decade of 20th century, a new series of discoveries was made. The electrons which were particles in the classical view were given a wave aspect by the work of De Broglie, Schrodinger, and Heisenberg.

The present atom is essentially composed of three sub-atomic particles: the electron, the proton and the neutron. Though there are other sub-atomic particles also, yet these three form the basis of the atom.

Electron

The Electron abbreviated "(e)", is a particle having a relative unit negative charge and with a mass of 9.109 x 10^{20} g. The mass of the electron is thus relatively small in terms of atomic mass units and is considered to be negligible for all practical purposes.

Protons

The Proton, abbreviated "P" is a particle having a relative unit positive charge. and with a mass of 1.675 x 10^{24} g. which is the same as that of a Hydrogen atom.

Neutron

The Neutron abbreviated "N", is a neutral particle, having no charge and with a mass of 1. 6748 x 10^{-24} g. which is the same as that of Hydrogen atom.

The following Table summarizes the data for the sub-atomic particles:

Particle	*Approximate Mass*	*Relatively Charge*
Electron (e)	Negligible	-1
Proton (P)	1	+1
Neutron (N)	1	0

Arrangement of Electrons, Protons and Neutrons

All the protons and neutrons are found in the nucleus. Since the protons are positively charged and the neutrons are neutral, the relative charge on the nucleus must be positive and equal to the number of protons. An atom is electrically neutral and hence the number of protons equals the number of electrons. Electrons are found outside the nucleus in "shells" of certain energy levels. In these`shells" the electrons are dispersed at a relatively great distance from the nucleus. The electrons increase in energy as they increase in distance from the nucleus. These principal energy levels are designated by whole numbers of capital letters as 1 or K, 2 or L, 3 or M and so on. Maximum number of electrons at principal energy levels is - $2n^2$ where n stands for integers (to 7 of the principal energy levels). The electrons in the principal energy levels are further divided into sub-levels. These sub-levels are labelled s, p, d and f; they also have a maximum number of electrons they can contain, which are 2, 6, 10 and 14 respectively. We can summarize maximum number of electrons [1 (k) to 7 (q)] Principle Energy Levels and their respective sub-levels) in the following table:

Principal Energy Level (Letter).	*Maximum Number of Electrons*		
	Sub-level	*Sub-level*	*Principel energy level*
1 (K)	s	2	2
2 (L)	s	2	8
		p	6
3 (M)	s	2	18
		p	6
		d	10
4 (N)	s	2	32
		p	6
		d	10
		f	14
5 (O)	s	2	50 (actually 32*)
		p	6
		d	10
		f	14
		g	18
6 (P)	s	2	72 (actually 11*)
		p	6
		d	10
		f	14
		g	18
		h	22
7 (Q)	s	2	98 (actually 2*)
		p	6
		d	10
		f	14
		g	18
		h	22
		i	26

This is the actual maximum number of electrons found for the elements known at present: hence, these principal energy levels are incomplete.

APPENDIX 9.2

SCIENCE AND NATIONAL WELFARE

Science and Spirituality

Indian thought upholds both religion and Science as valid disciplines in the pursuit of truth. India's thinkers never found any contradiction between the two. The method of investigation in the field of religion is largely the same as in the positive sciences. A thorough scientific study of the facts of the inner life was undertaken by the great thinkers of ancient India; the insights which they gained were re-tested and by a galaxy of subsequent thinkers. It is because of this that Indian spirituality has stood the test of time and is also fully hospitable to modern Science.

He then concludes that there is no conflict between Science and religion. Both have the identical aim of helping man to grow in spirituality, and of ushering in a better social order. Each by itself is insufficient and helpless. The combination today of ·the spiritual energies of these two complementary disciplines in the life of man will - -produce fully integrated human beings and thus help to evolve a complete human civilization. This synthesis is the most outstanding contribution of Swami Vivekananda to human thought of the present time.

It has been the conclusion of many thinkers that great movements in India have always had a basis in spirituality and her part in the harmony of nations is to play the spiritual note. The recent example of Gandhiji confirms that we have not lost the great tradition. His whole life was a grand effort to spiritualise politics. Will it not be far more easy to bring Science and spirituality together?

Intellectual and Cultural Values of Science

From very ancient days Science has continued to have intellectual and cultural values. Though culture is popularly associated with certain shows, it is not easy to define, as numerous components are involved, the most important being the scientific and rational attitude of mind. Imagine what would have been the level of our ancient culture aid civilization if the attitude of enquiry and critical assessment and search for truth at all levels, physical, mental and spiritual, was not there. In the modern context, this is forgotten midmost of the cultural activities have, very little of Science component in them. There is another aspect of Science and that is its importance for mental and intellectual health. All of us know how costly cricket is and all other sports including wrestling, boxing, hunting mountaineering and travel.

Sports are generally intended to foster bodily health and fitness though this is frequently forgotten and the business part and other considerations become dominant. Mind is far more important, powerful mid valuable and should be kept in proper health and condition. For the purpose nothing can be better than Science, sad many great people obviously took to Science for this primary attraction- Very early in the history of civilization. Mathematics and Astronomy received attention. They continue to be attractive even now, though many other aspects of Science have developed similar values in recent years. for example, Particle Physics and Structural Chemistry and Molecular Biology.

In a welfare state we are very much concerned about incentives. Monetary rewards have:obvious limits. In the alternative our minds would be hitched to higher ideals which have no such limitations. According to the scriptures the twin ideals of every human being should be (1) liberation or uplift of the Individual and (2) the good of the World. Science is in reality an excellent means for developing the minds and spirit to achieve higher goals. If this faith could grow among scientists, their status will rise remarkably and the ancient vedic prayer which is equally the prayer of modern Science will be fully answered:

> From the unreal lead me to the real
> From darkness lead me to light
> From death lead me to immortality.

Source: Prof. T.R. Seshadri, FRS, FNI, 1967, Hyderabad on Science and National Welfare. (Some Abstracts).

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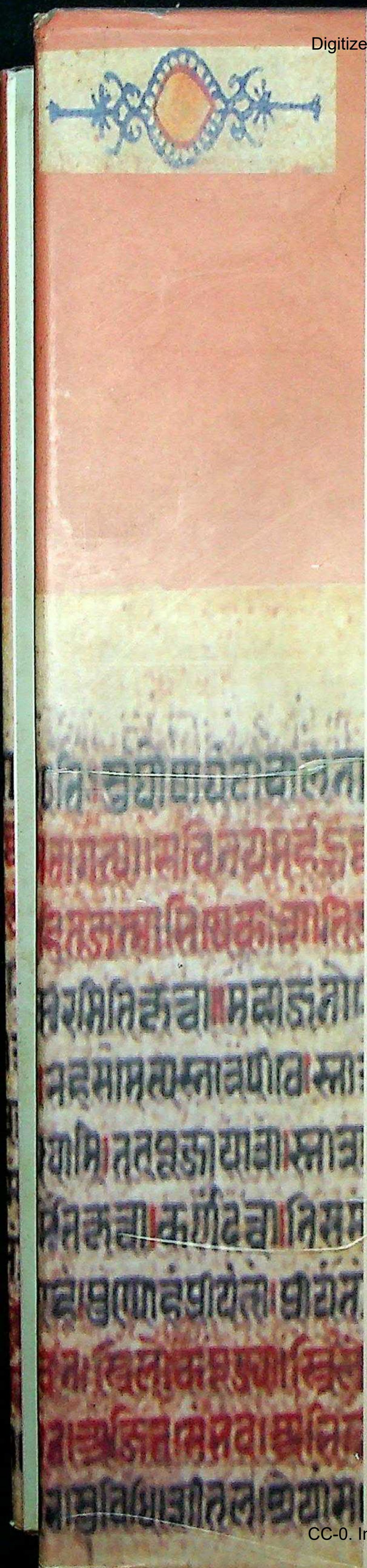

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